DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **Occidental Chemical - Durez Division, Niagara Plant**
Facility Address: **5000 Packard Road, Niagara Falls, New York**
Facility EPA ID #: **NYD002103216**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

_✓__ If yes - check here and continue with #2 below.

_____ If no - re-evaluate existing data, or

_____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	_✓__	___	___	**phenols, chlorobenzenes, xylenes, acetone**
Air (indoors)[2]	___	_✓__	___	_____
Surface Soil (e.g., <2 ft)	_✓__	___	___	**phenols, chlorobenzenes, xylenes, acetone**
Surface Water	___	_✓__	___	_____
Sediment	___	_✓__	___	_____
Subsurf. Soil (e.g., >2 ft)	_✓__	___	___	**phenols, chlorobenzenes, xylenes, acetone**
Air (outdoors)	___	_✓__	___	_____

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__✓___ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):_____

FACILITY BACKGROUND/DESCRIPTION

The Occidental Chemical Corporation (OCC), Durez Division, Niagara Plant is a phenol-formaldehyde resin manufacturing plant.

Location

The plant is located in the City of Niagara Falls, New York, approximately 2 miles north of the Niagara River (**Figure 1**). The plant property consists of 4.6 acres which are dedicated to manufacturing operations. The area surrounding the plant is industrial. To the north, the site is bordered by Niagara Mohawk Power Corporation (NIMO) transmission lines and right-of-way, and Frontier Roadway Maintenance Corporation. To the east, are Conrail railroad tracks and NIMO transmission lines. To the south, the site is bordered by Packard Road. CECOS International is located southeast of the site across Packard Road. International Bag Company (formerly Frontier Bronze Corporation) is located to the west. The closest residential area is approximately three quarters of a mile to the west of the site.

History of Owner/Operators
The plant was owned and operated by Reichold Chemicals from the 1920s to 1986. BTL Specialty Resins Corporation was the owner/operator from 1986 to 1989. OCC has been owner/operator since 1989.

Facility Hazardous Wastes
The hazardous wastes generated at this facility are ignitable and/or toxic solvent washings from reactor vessels, spilled raw materials and small amounts of laboratory samples. The wastes include F003 and F005 (spent non-halogenated solvents), U122 (formaldehyde), U188 (phenol), and D001 (ignitable). These wastes are stored and treated on site in the RCRA-regulated hazardous waste container storage area, hazardous waste tank 63 and incinerator.

CORRECTIVE ACTION ACTIVITIES

Nineteen Solid Waste Management Units (SWMUs) have been identified at the facility (**Figure 2**). OCC has completed the "RCRA Facility Investigation" (RFI) (January 1991), and the "Corrective Measures Study, Groundwater Remediation" (April 1993), to identify the extent of releases of hazardous waste constituents from the SWMUs and to evaluate possible remedial measures that could be employed to address those releases. As a result of the investigation, OCC has concluded that although hazardous waste constituents have been released to the fill/soil and groundwater beneath the facility, releases from the SWMUs are no longer significant sources of contamination. Therefore, all SWMUS at the facility are being addressed through implementation of a site-wide corrective measures program.

A list of the principle hazardous waste constituents which have been released to the groundwater, and the "groundwater protection standard" for the constituents is included in Table 1.

TABLE 1

PARAMETER	CAS#	GROUNDWATER PROTECTION STANDARD (µ/L)
Organic Compounds		
Acetone	67-64-1	5.0×10^1
Xylene (total)	1330-20-7	5.0
Ethylbenzene	100-41-4	5.0
Phenol	108-95-2	5.0 x 10
o-Dichlorobenzene	95-50-1	4.7
p-Dichlorobenzene	106-46-7	4.7

Aqueous phase contamination has been observed in the soils and unconsolidated sediments (overburden) at the facility and in the bedrock. The extent of the aqueous phase plume in the overburden appears to be primarily limited to the facility property. The extent of the aqueous phase bedrock plume is somewhat greater; but the concentration of the contaminants decreases substantially in the off-site areas. The stratigraphic extent of the contamination is limited to the upper 65 feet of the bedrock. The geographic distribution of the contaminant plumes is represented on Figures 3 and 4. A depiction of the pumping intervals and representative potentiometric surface maps are portrayed on Figures 5 through 8.

Corrective Measures Implementation

Prior to the selection of Final Corrective Measures, OCC implemented a number of "Interim Corrective Measures to address the soil and groundwater contamination at the facility. These measures have included:

1. Excavation and removal of a former lagoon;
2. Improvements and replacements to the tank farms;
3. Excavation and removal of contaminated soils in the area of former Tank Farm A;
4. Elimination of a part of the on-site sewer system;
5. Construction of an asphalt cap over all exposed ground surfaces at the facility;
6. Installation of an overburden drain tile collection system; and,
7. Installation of a bedrock groundwater collection system.

The Department determined that these Interim Corrective Measures, in conjunction with long-term operation of the bedrock and overburden groundwater remedial systems, have been successful in reducing the potential threat to human health and the environment and are capable of achieving the remedial goals. The "Corrective Measures Implementation Program" specified in Module III of the 6 NYCRR Part 373-2 Permit(September 1995) is based upon continued operation of the interim groundwater remedial programs and serves as the "Final Remedy" for the facility.

Effectiveness Monitoring

Subsequent to issuance of the Permit, OCC has been performing hydraulic and chemical monitoring at the facility to demonstrate that the remedial goals are being achieved. The monitoring data are summarized in annual reports to the NYSDEC. Based upon the information in those reports, the NYSDEC has determined that the remedial program is meeting its design objectives. The magnitude of

groundwater contamination at the facility has been decreasing as expected (Table2). See the "Annual Review of Groundwater Extraction System, July 1,1998 through June 30, 1999" and the "Annual Review of Groundwater Extraction System, July 1,1999 through June 30, 2000" for details regarding the performance of the remedial program..

In July 2000, the NYSDEC approved an "In Situ Treatment System Pilot Study" to evaluate the effecacy of injecting potassium permanganate into the bedrock and overburden groundwater zones to accelerate the natural biodegradation of the contaminant plumes. That study is currently under way.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions? **NO. See discussion above.**

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	___	___	___	___			___
Air (indoors)	___	___	___				
Soil (surface, e.g., <2 ft)	___	___		___	___	___	___ ___
Surface Water	___	___				___	___ ___
Sediment	___	___				___	___ ___
Soil (subsurface e.g., >2 ft)				___			___
Air (outdoors)	___	___		___	___	___	

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__✓__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):__**Groundwater and soil contamination has been addressed. Final Corrective Measures have been selected and the Corrective Measures have been implemented. These actions, coupled with the institutional controls, are designed to preclude completion of any potentially significant human exposure pathways through those media.**

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[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)? **NA**

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):_____

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits? **NA**

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):_____

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility): **See discussion above.**

_✓___ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **_Occidental__Packard Road** facility, EPA ID **#NYD002103216**, located at **5000 Packard Road, Niagara Falls, New York** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) William E Wertz Date ___9/22/2000___
(print) William E. Wertz, Ph.D.
(title) Senior Engineering Geologist

Supervisor (signature) Paul J. Merges Date 9/22 /2000
(print) Paul J. Merges, Ph. D.
(title) Director, Bureau of Radiation & Hazardous Site Management
(EPA Region or State) NYSDEC

Locations where References may be found:

NYSDEC
Division of Solid and Hazardous Materials
50 wolf Road
Albany NY 12233

Contact telephone and e-mail numbers

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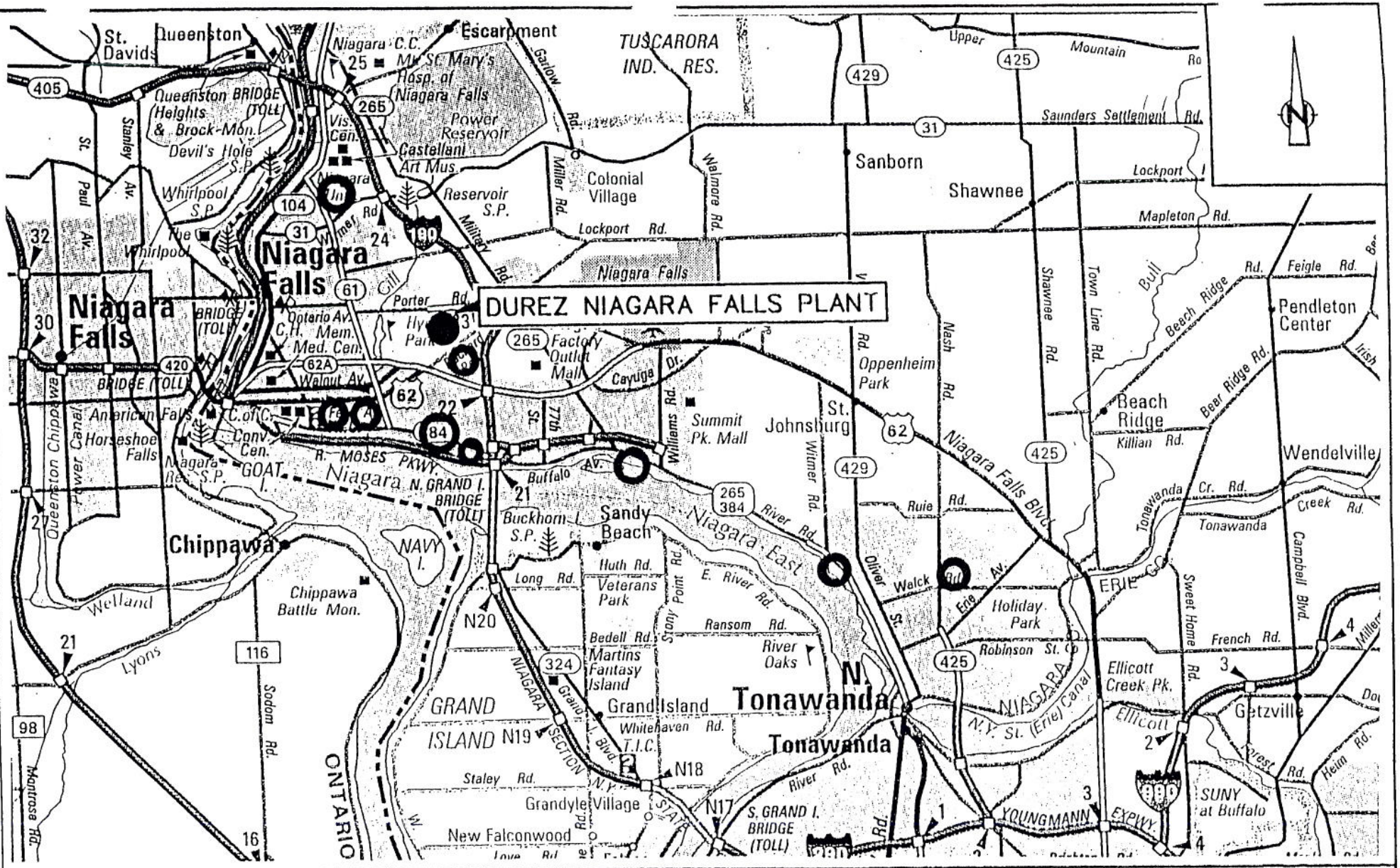
(phone #)	(518) 457-9253
(e-mail)	wewertz@gw.dec.state.ny.us

Note: Figures are attached as a separate file: **OCCEIFig**..pdf

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.



SOURCE: RAND McNALLY ROAD ATLAS,–1996

figure 1

SITE LOCATION

CRA

Durez Engineering Materials – Niagara Falls Plant Site

9855 (1) APR 24/97 (W) REV.0

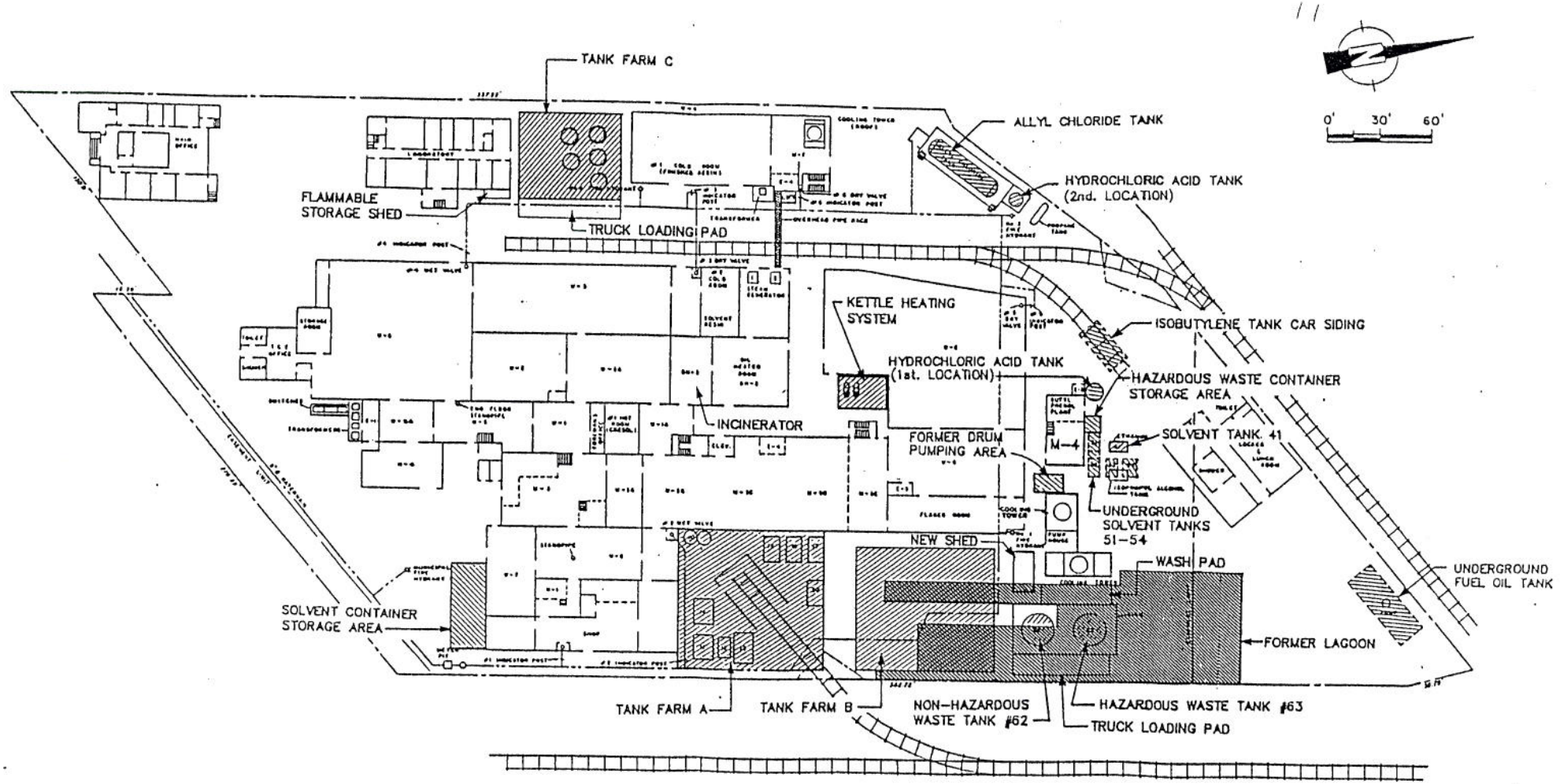


figure 2.

FORMER AND CURRENT SOLID WASTE MANAGEMENT UNIT LOCATIONS
RCRA FACILITY INVESTIGATION
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

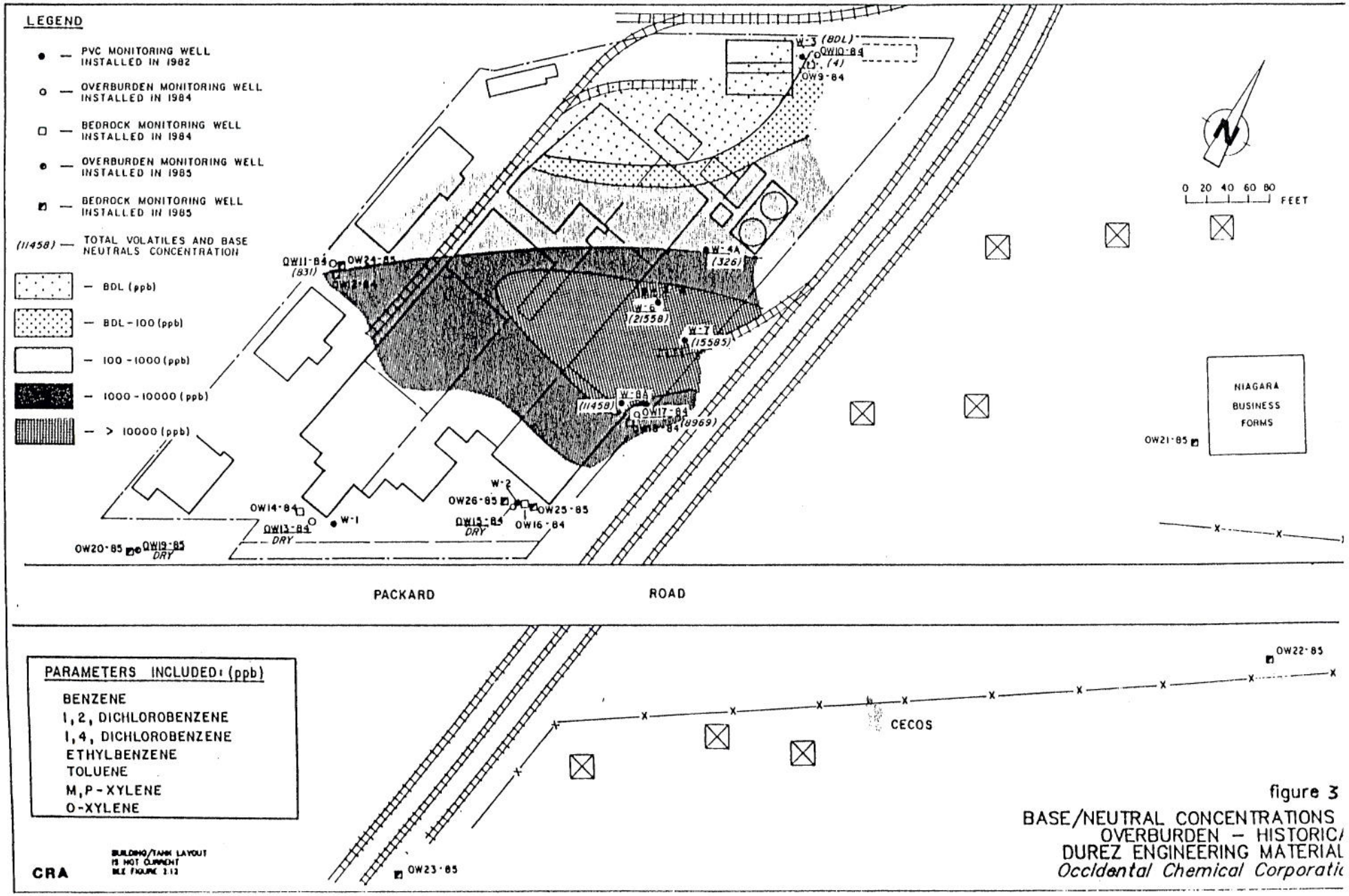


figure 3

BASE/NEUTRAL CONCENTRATIONS
OVERBURDEN – HISTORIC
DUREZ ENGINEERING MATERIAL
Occidental Chemical Corporati

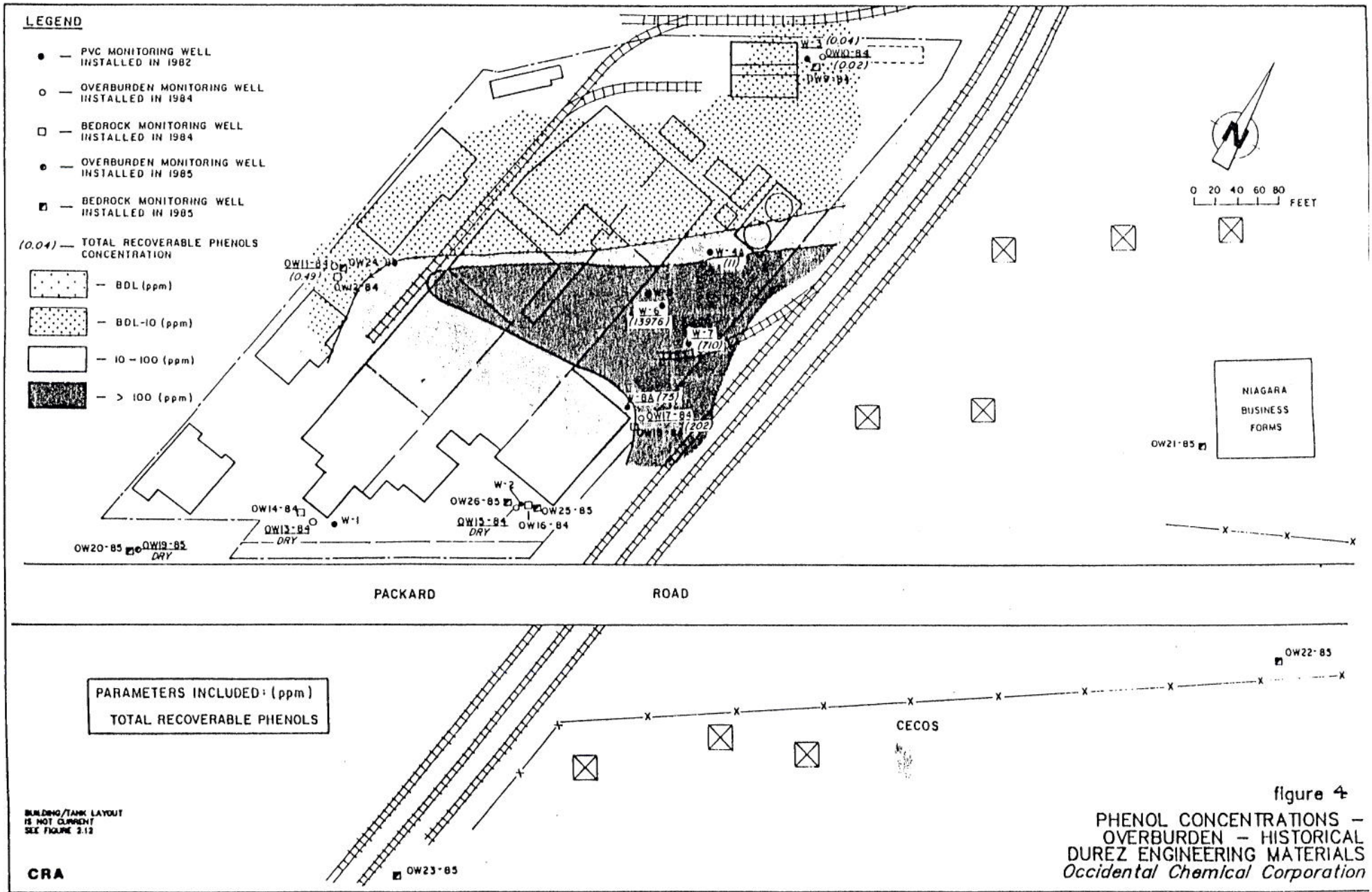


figure 4

PHENOL CONCENTRATIONS – OVERBURDEN – HISTORICAL
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

2602 (20) APR.14/93 REV.0

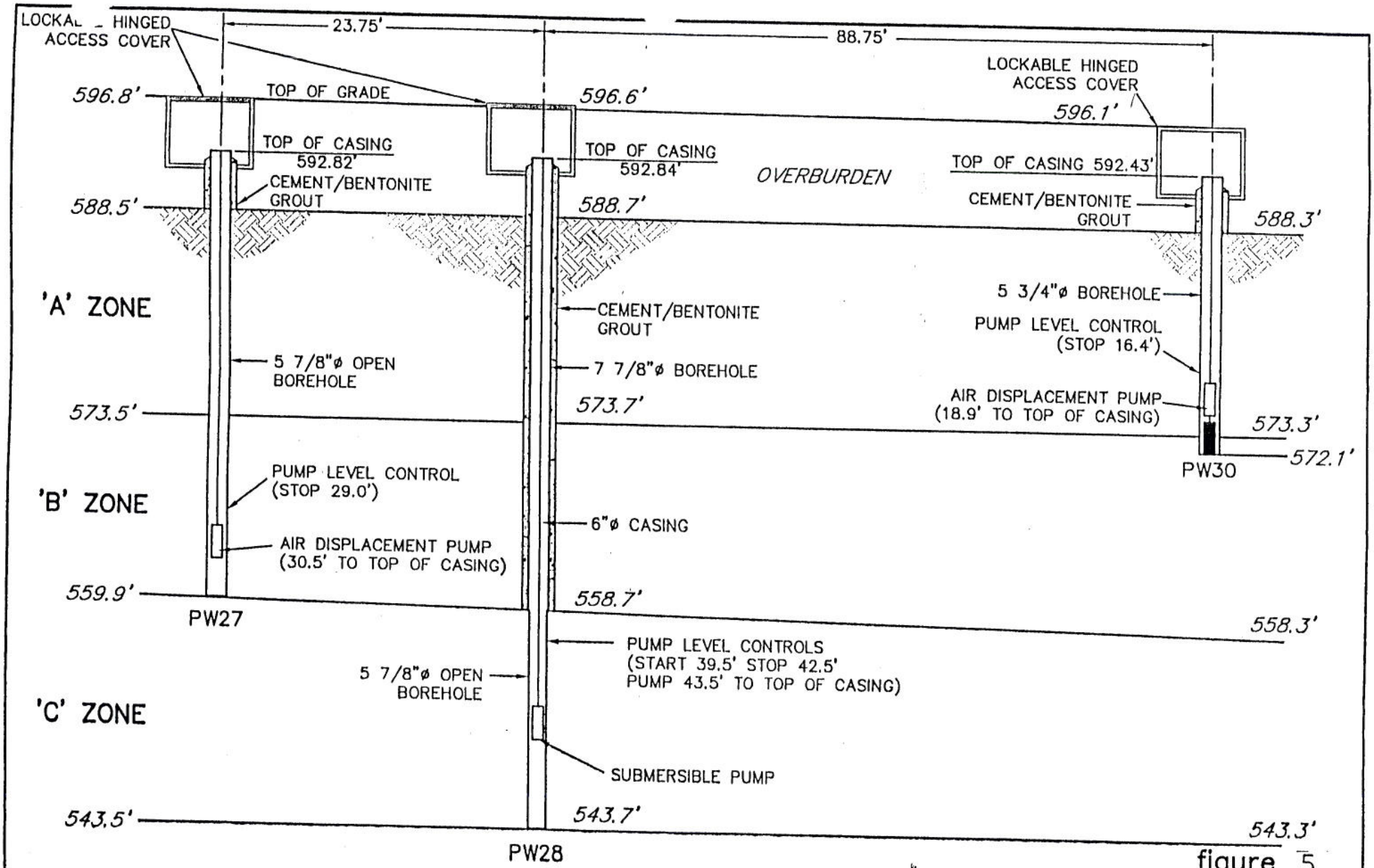


figure 5

PURGE WELLS CROSS SECTION
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

CRA

02602-00(030)GN-NF002 AUG 24/1999

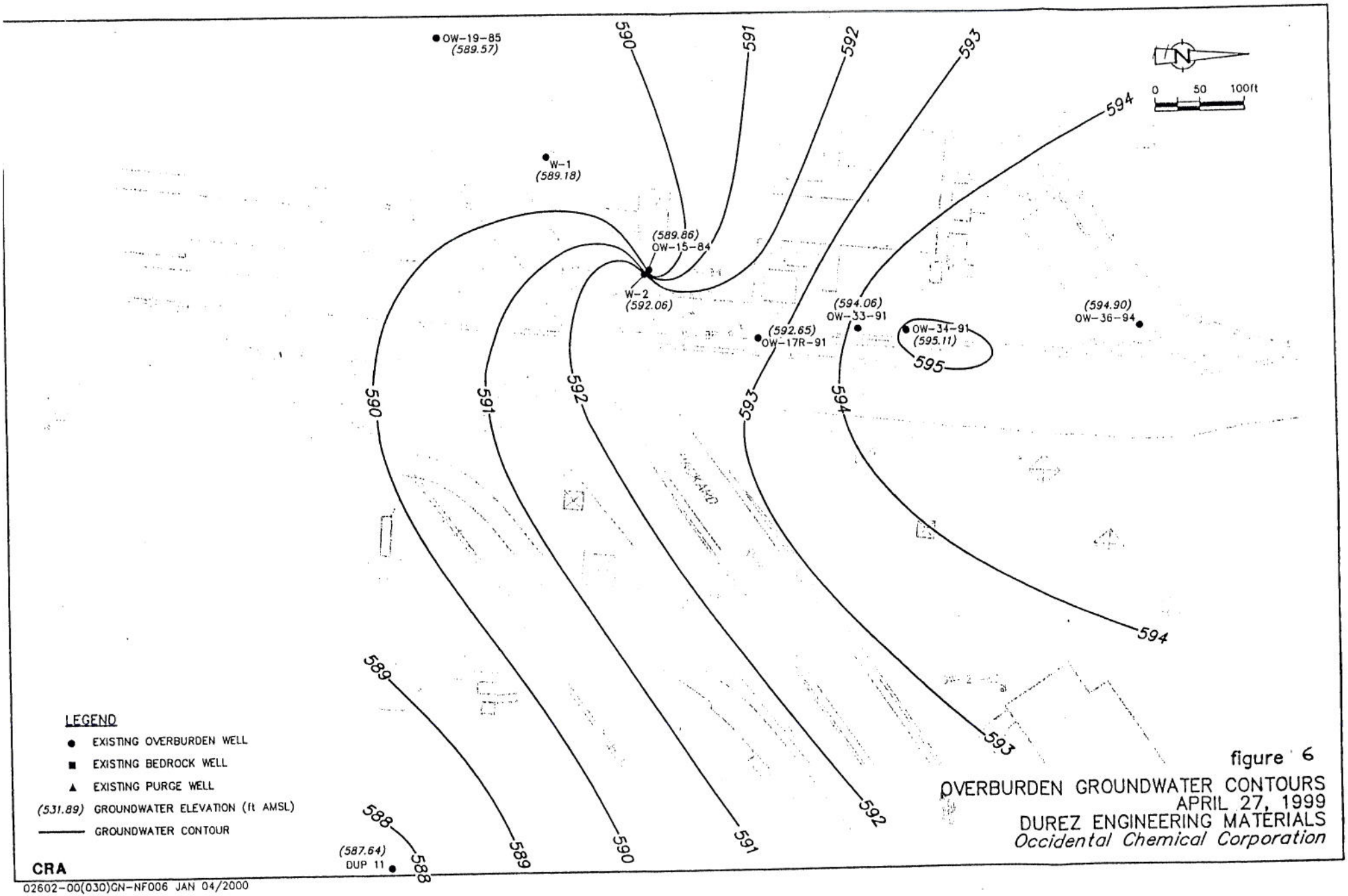


figure 6

OVERBURDEN GROUNDWATER CONTOURS
APRIL 27, 1999
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

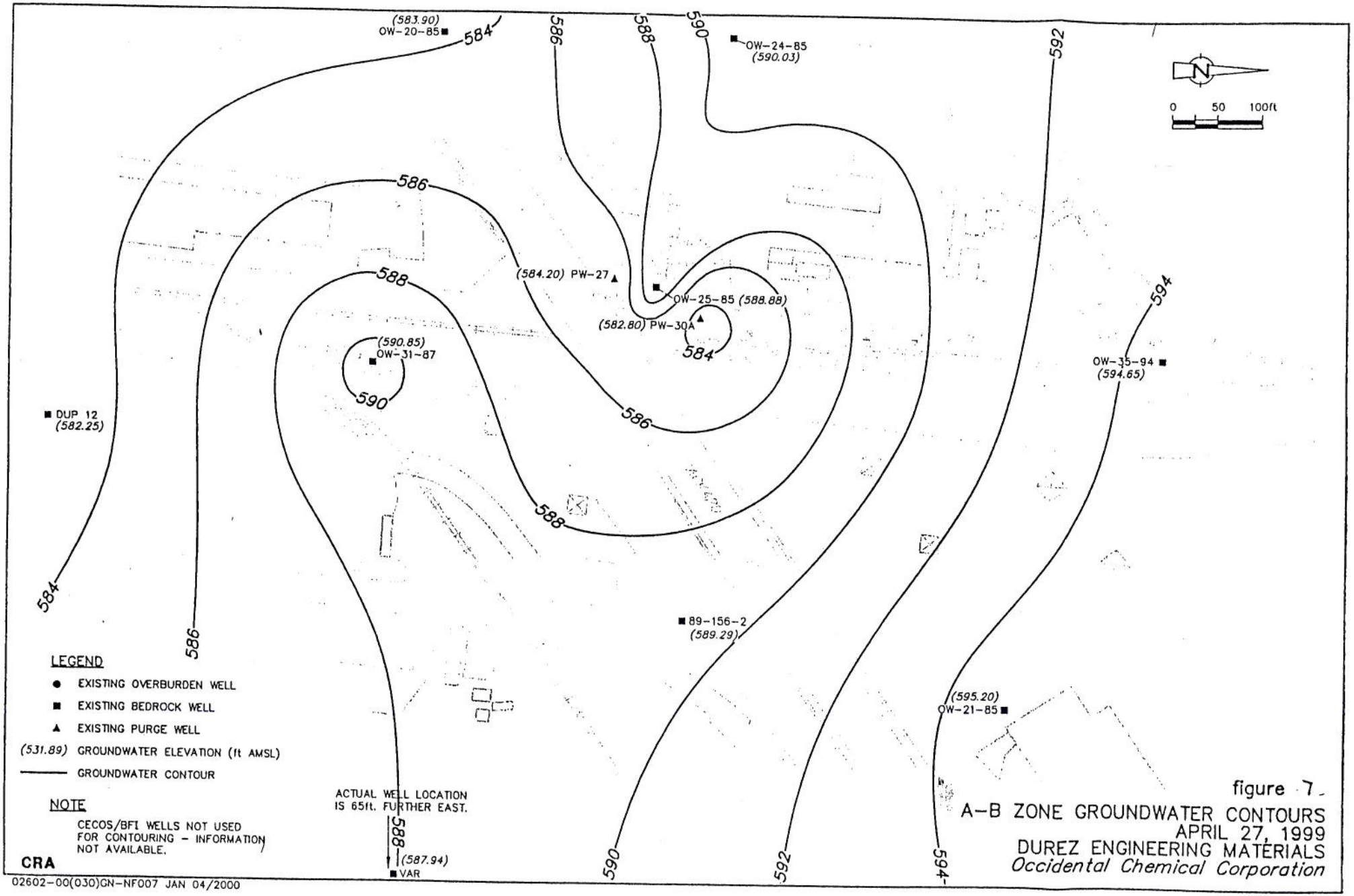


figure 7

A-B ZONE GROUNDWATER CONTOURS
APRIL 27, 1999
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

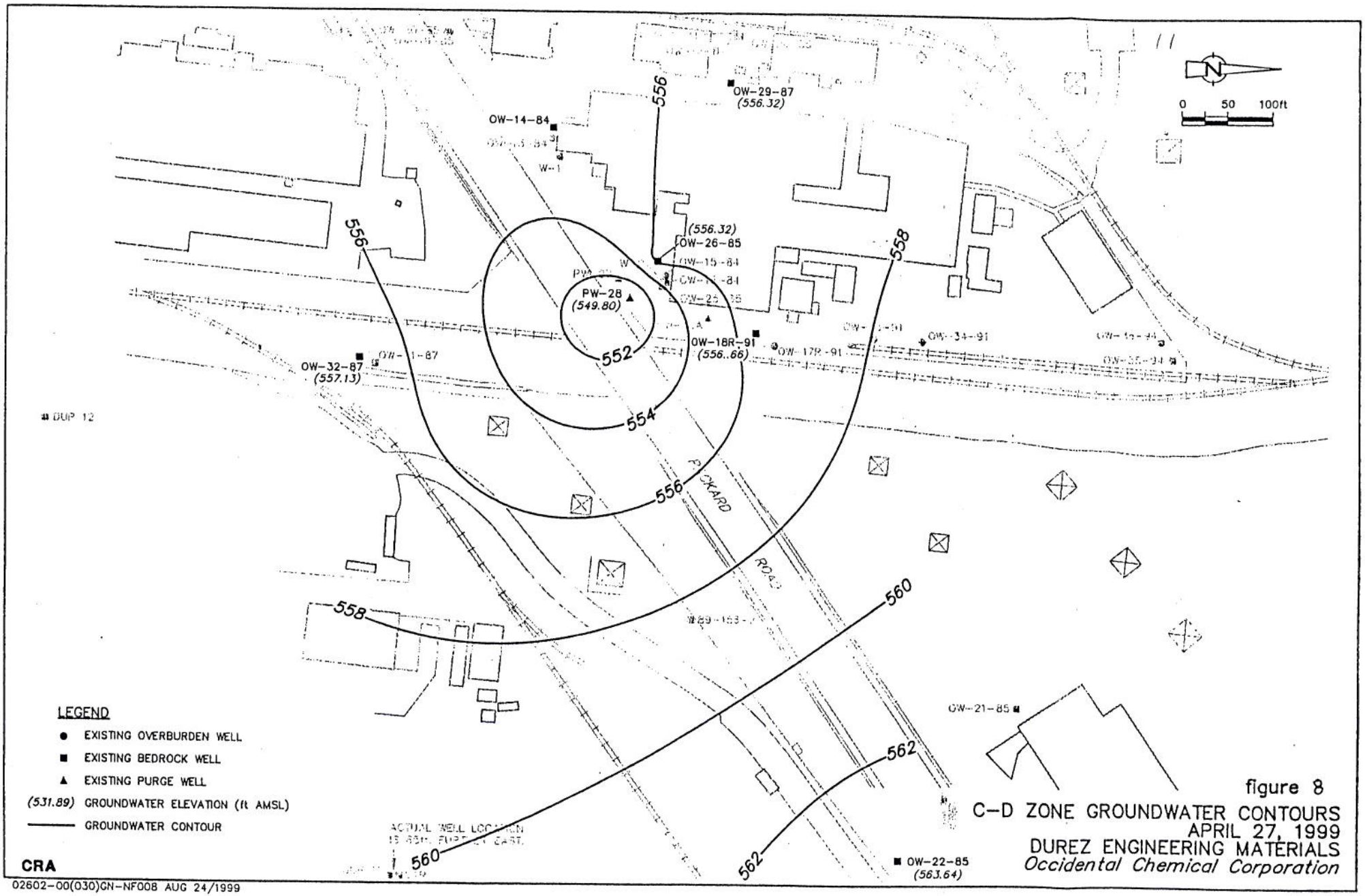


figure 8

C-D ZONE GROUNDWATER CONTOURS
APRIL 27, 1999
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

SUMMARY OF PHENOLICS LOADINGS AND FLOWS BY WELL
OCCIDENTAL CHEMICAL CORPORATION
DUREZ ENGINEERING MATERIALS

Time Start	Period End	PW-27 Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)	PW-28 Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)	PW-30 Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)	Manhole Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)
Mar-89	Feb-90	306,296	*38.9*	99.4	*133.7*	1,275,938	*10.18*	108.33	*250.40*	936,418	*0.00*	0.00	*0.00*				
Mar-90	Mar-91	94,755	*19.0*	15.0	*65.2*	1,128,592	*71.23*	670.45	*1752.06*	203,038	*327.48*	554.53	*1933.61*				
Apr-91	Mar-92	325,694	190.00	516.09	*652.89*	2,173,132	2.90	52.56	*71.33*	556,794	170.00	789.42	*1003.77*				
Apr-92	Mar-93	338,688	*0.3245*	0.92	*1.12*	1,572,480	*202.5*	2655.68	*4980.93*	483,840	*119.76*	483.26	*707.12*				
Apr-93	Mar-94	160,559	0.005	0.01	*0.02*	2,428,934	4.6	93.18	*113.15*	881,957	190.00	1397.55	*1121.86*	180,165	65	97.67	47.72
Apr-94	Mar-95	622,337	0.071	0.37	*0.24*	3,453,141	0.54	15.55	*13.28*	946,337	100.00	789.25	*590.45*	129,791	70	75.77	51.39
Apr-95	Jul-96	845,412	*0.0275*	0.50	*0.24*	5,157,472	*176.4*	7587.55	*4338.94*	1,277,107	*16.95*	180.54	*100.08*	105,279	70	61.46	51.39
Aug-96	Jun-97	664,683	0.015	0.08	*0.05*	4,183,914	180	6280.89	*4427.49*	643,187	13.00	69.73	*76.76*	35,300	235	69.18	172.52
Jul-97	Jun-98	433,292	0.005	0.02	*0.02*	4,109,484	1.90	65.12	*46.73*	656,562	20.00	109.51	*118.09*	36,225	50.5	15.26	37.07
Jul-98	Jun-99	328,475	0.025	0.07	*0.09*	4,009,933	1.20	40.13	*29.52*	494,511	24.00	98.98	*141.71*	41,400	49	16.92	35.97
	Total:	4,120,191		632.45	*853.58*	29,493,020		17569.45	*16023.83*	7,079,751		4472.78	*5793.45*	528,160		336.26	396.07
	Avg.	*412,019.10*	*24.84*		*85.36*	*2,949,302.00*	*65.15*		*1,602.38*	*707,975.10*	*98.12*		*579.34*	*88,026.67*	*89.92*		*66.01*

Notes:

1 Phenol concentration is average if multiple analyses are available for a time period or actual if only one analyses was performed for that time period.

2 Phenol loading is calculated using the calculated flow for each time period and the phenol concentration for each time period.

3 Average phenol loading is calculated using the average flow for the nine time periods and the phenol concentration for each time period.

Italics indicates number is an average value.

Calculation for loading is (8.34 x flow/1,000,000) x conc.

ppm Parts Per Million.