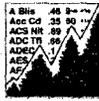


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Nationwide Environmental
Management and
Engineering Services

SEISMIC REPORT



**Newport Marina Apartments
919 Bayside Drive
Newport Beach, California 95827**

November 6, 2003

EBI Project #23-2629C

Prepared for:

**Chinatrust Bank
c/o Johnson Capital iCap
18101 Von Karman Avenue, Suite 1050
Irvine, California 92612**

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**EBI CONSULTING
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BURLINGTON, MA 01803
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EBI PROJECT # 23-2629C**

SEISMIC REPORT

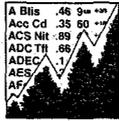
***Newport Marina Apartments
919 Bayside Drive
Newport Beach, California 95827***

November 6, 2003



Prepared for:

**Chinatrust Bank
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18101 Von Karman Avenue, Suite 1050
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PORTLAND, OR
SAN FRANCISCO, CA
WARWICK, RI

November 6, 2003

Chinatrust Bank
c/o Ms. Victoria Castillo
Johnson Capital iCap
18101 Von Karman Avenue, Suite 1050
Irvine, California 92612

Subject: Seismic Report, Newport Marina Apartments
919 Bayside Drive, Newport Beach, California
EBI Project # 23-2629C

Dear Ms. Castillo:

Attached please find our *Seismic Report* (the *Report*) for the above-mentioned asset (the *Subject Property*). During the property investigation and research, our inspector met with agents representing the *Subject Property*, or agents of the owner, and reviewed the property and its history at length. The *Report* was completed according to the terms and conditions authorized by you.

The purpose of this *Report* is to assist *Chinatrust Bank*, in its underwriting of a proposed mortgage loan on the *Subject Property* described herein.

This *Report* is addressed to *Chinatrust Bank*, and such other persons as may be designated by *Chinatrust Bank*, and their respective successors and assigns.

Reliance on the *Report* and the information contained herein shall mean (i) the *Report* may be relied upon by *Chinatrust Bank*, in determining whether to make a loan evidenced by a note secured by the *Property* ("the *Mortgage Loan*"); (ii) the *Report* may be relied upon by any purchaser in determining whether to purchase the *Mortgage Loan* from *Chinatrust Bank*, or an interest in the *Mortgage Loan* or securities backed or secured by the *Mortgage Loan*, and any rating agency rating securities representing an interest in the *Mortgage Loan* or backed or secured by the *Mortgage Loan*; (iii) the *Report* may be referred to in and included, in whole or in part, with materials offering for sale the *Mortgage Loan* or an interest in the *Mortgage Loan* or securities backed or secured by the *Mortgage Loan*; (iv) the *Report* speaks only as of its date in the absence of a specific written update of the *Report* signed and delivered by EBI.

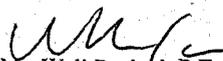
There are no intended or unintended third party beneficiaries to this *Report*, unless specifically named herein.

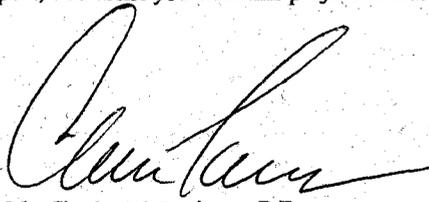
This *Report* has been completed in general conformance with the Standard Guide for the Estimation of Building Damageability in Earthquakes: ASTM Standard E 2026-99.

EBI is an independent contractor, not an employee of either the issuer or the borrower, and its compensation was not based on the findings or recommendations made in the *Report* or on the closing of any business transaction.

Thank you for the opportunity to prepare this *Report*, and assist you with this project. Please call us if you have any questions or if we may be of further assistance.

Respectfully Submitted,


Mr. Wali Reshad, P.E.
Author/Senior Engineer


Mr. Charles M. Losinger, P.E.
Reviewer/Executive Vice President

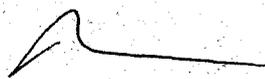

Mr. Tim Hasselbach
Vice President

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Modified Mercalli Intensity Scale
Seismic Zone Map of the United States

EXECUTIVE SUMMARY

The Subject Property, known as Newport Marina Apartments, is a multi family complex consisting of fourteen, 2-story apartment buildings and three single-story garage structures that were reportedly built in 1959. The buildings contain a total of 64 apartment units and 70 garage spaces, including the three apartment buildings' tuck-under garage spaces. The buildings are located on 3.12± acres of land.

The property is located in Newport Beach, southern California, at 919 Bayside Drive and approximately 45 miles southeast of downtown Los Angeles.

Mr Wali Reshad, P.E., of EBI Consulting surveyed the property on November 4, 2003. Ms. Kathleen Gatchell, the Subject Property manager, was present during the site visit. The purpose of our review and Report is to determine the Probable Maximum Loss (PML) for the property based on a seismic event that has a 475-year return period or a 10% chance of exceedance in a 50-year exposure period.

No related as-built structural drawings were available for review at the time of this assessment. Based upon our site visit, review of the available documents and utilizing the FRISKSP statistical computer program and USGS database, the Probable Maximum Loss (PML) for the subject Newport Marina Apartments (buildings) constructed in 1959 is estimated at **18%** of the replacement cost of the buildings.

The Subject Property is not located in an area subject to the Alquist-Priolo Earthquake Studies Zone. The buildings appear to have been provided with the basic lateral load resisting system for Seismic Zone 4.

The buildings appear to have been provided with the basic lateral load resisting elements in accordance with the applicable building code in effect at the time of the original design and construction. No existing or prior significant structural or foundation damage was reported or observed.

1.0 INTRODUCTION

The exclusive purpose of this *Seismic Report* (the *Report*) is to assist *Chinatrust Bank* in its underwriting of a proposed mortgage loan on the Subject Property described in this *Report*. This *Report* has no other purpose and should not be relied upon by any other person or entity. Reliance upon this *Report* does not extend to property owners, or entities or individuals interested in purchasing the subject property. Amendments to EBI's limitations as stated herein that may occur after issuance of the *Report* are considered to be included in this *Report*. Payment for the *Report* is made by, and EBI's contract and *Report* extends to *Chinatrust Bank* only. By accepting draft and final Reports, *Chinatrust Bank* agrees to these terms and limitations.

The information reported was obtained through sources deemed reliable, a visual site survey of areas readily observable, easily accessible or made accessible by the property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property. Municipal information was obtained through file reviews of reasonably ascertainable standard government record sources, and interviews with the authorities having jurisdiction over the property. Findings, conclusions and recommendations included in the *Report* are based on our visual observations in the field, the municipal information reasonably obtained, information provided by the Client, and/or a review of readily available and supplied drawings and documents. No disassembly of systems or building components or physical or invasive testing was performed. EBI renders no opinion as to the property condition at un-surveyed and/or inaccessible portions of the Subject Property. EBI relies completely on the information, whether written, graphic or verbal, provided by the property contact, owner or agent, or municipal source, or as shown on any documents reviewed or received from the property contact, owner or agent, or municipal source, and assumes that information to be true and correct. The observations in this *Report* are valid on the date of the survey. EBI uses the date of first occupancy to establish the Subject Property age.

The contents of the *Report* are not intended to represent an in-depth acquisition analysis of the Subject Property. Anyone wanting information about the condition or characteristics of the property should consult the appropriate professional. The extent of the physical survey for the production of this *Report* has been limited, by contract and agreed upon Scope of Work (consistent with the guidelines of Standard Guide for the Estimation of Building Damageability in Earthquakes: ASTM Standard E 2026-99) to a "walk through" of the property. Assumptions regarding the overall condition of the property have been developed based upon a survey of representative areas of the Subject Property. As such, no representation of *all* aspects of *all* areas or components is made.

Any additional information that becomes available after our inspection and draft submission concerning the Subject Property should be provided to EBI so that our conclusions may be revised and modified if necessary, at additional cost. This *Report* has been prepared in accordance with our Standard Conditions for Engagement, which is an integral part of this *Report*.

The inspection was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The *Report* speaks only as of its date, in the absence of a specific written update of the *Report*, signed and delivered by EBI.

2.0 PROCEDURES AND LIMITATIONS

This report is based upon a site visit assessment performed on November 4, 2003. The Probable Maximum Loss (PML) has been estimated utilizing the FRISKSP statistical software program and USGS database. This PML has been estimated such that it will not be exceeded in 90% of the buildings of a given class. The PML value is not intended to be a guarantee of how the property will perform in a seismic occurrence. It is a statistical review that is intended to suggest how the property will be affected by a probable seismic event.

The PML values are provided as a mean recurrence interval or a probability of exceedance. The mean recurrence interval is the average period of time, in years, between the occurrences of earthquakes that produce effects of the same, or greater, severity. The probability of exceedance (e.g., 10% in 50 years) is a statistical representation of the chance that earthquake effects exceeding a given severity will be experienced at the site within a specified number of years.

The PML does not take into account the value of equipment, inventory or monetary loss from business interruption. EBI represents that the estimate of seismic performance for these buildings is based on a limited review of the property condition, the FRISKSP statistical computer program, USGS database and on engineering judgment that is incorporated into the damage prediction method developed by Messrs. Charles C. Thiel, Jr. and Theodore C. Zsutty. Engineering judgment is a necessary component of this review since analytical methods do not exist that will encompass all parameters required to determine an exact cost of any damage caused by the maximum possible earthquake.

This report represents our professional experience and judgment, and a good faith effort to obtain all available information. Documents and information provided by the client, designated representatives of the client or other interested parties, and consulted in the preparation of this report, have been used herein, with the understanding that EBI assumes no responsibility or liability for their accuracy or for the withholding by any of the involved parties of any reports or other information that could effect the transaction.

3.0 PROPERTY DESCRIPTION

3.1 GENERAL INFORMATION

The Subject Property is a multi family complex consisting of fourteen, 2-story apartment buildings and three single-story garage structures that were reportedly built in 1959. The buildings contain a total of 64 apartment units and 70 garage spaces, including the three apartment buildings' tuck-under garage spaces. Each building plan configuration is rectangular or irregular-shaped.

3.2 BUILDING AND SITE CHARACTERISTICS

For purposes of this analysis, buildings can be grouped into various classes. Buildings within the same class can be expected to perform similarly at different levels of earthquake shaking. To account for the differences between buildings within the same class, additional information is utilized.

Based on areas available to view, the building general characteristics are as follows:

Building Characteristics:	
General Construction Class:	Wood framing
Number of Buildings	Fourteen apartment buildings and three car garage structures
Number of Stories:	Apartment buildings are 2 stories and garage structures are single story
Year Constructed:	Circa 1959
Occupancy Type:	Multi family residential
Roof Structure	Wood trusses and rafters surfaced with plywood sheathing
Second Floor Structure	Wood beams and joists surfaced with plywood sheathing
Vertical Load Carrying System	Wood stud bearing walls and posts
Lateral/Horizontal Load Carrying System	Wood stud shear walls in conjunction with wood framed upper floor and roof diaphragms
Ground Floor/Lowest Floor	Concrete slab on grade
Foundation System	Concrete continuous and pad footings under walls and columns
Structural Deficiencies	None noted or reported
Secondary Structural Characteristics:	
Shape Configuration:	Rectangular or irregular-shaped in plan views
Structural Irregularities:	Reentrant corners, overhangs/canopies and recesses
Redundancy:	Appeared adequate
Torsion:	Moderate
Building Exterior:	Primarily stucco and wood siding with accents of stone and brick veneers
Ornamentation:	Average
Wall-Slab Connection:	Assumed adequate
Structural Upgrade:	None noted or reported
Engineered Foundation:	Assumed yes
Mechanical/ Electrical Equipment:	Generally braced
Construction Quality:	Appeared standard for date of construction
Hazardous Exposure	None reported

Seismic Zone	4, defined as areas of high probability of damaging ground motion
--------------	---

SITE CHARACTERISTICS

The soil conditions at a site can influence the damageability of a structure in two general ways:

- Soft soils tend to amplify ground motion.
- Collateral hazards such as soil liquefaction, sliding or rupturing can potentially result in considerable damage to a structure.

No specific soil information was readily available for this site. The general soil data was obtained from the California State Department of Conservation Geologic Map (dated 1991) and the Reconnaissance Seismic Hazard Map for the Newport Beach Quadrangle (dated April 15, 1998) and is shown below:

SITE SOIL TYPE:	<i>Alluvium (Sandy) material</i>
-----------------	----------------------------------

COLLATERAL HAZARDS

LIQUEFACTION POTENTIAL:	<i>Liquefaction potential exists in the vicinity based on generalized California seismic hazard maps. A site-specific geotechnical investigation is required if more accurate soil information is required.</i>
LANDSLIDE POTENTIAL:	<i>None</i>
FAULT RUPTURE POTENTIAL	<i>Assumed low; the Newport-Inglewood (L.A. Basin) Fault is closest known fault to the site and it is located about 2 miles away.</i>

4.0 SEISMIC REVIEW

4.1 SITE SEISMICITY

The Richter Magnitude Scale gives an indication of the absolute energy released in an earthquake. However, generally speaking, the further a building is from the epicenter, the less shaking it will experience. As such, just considering the magnitude of an earthquake does not give an adequate picture of the building's risk, since the distances from potential earthquake sources to the subject site must also be considered.

The Modified Mercalli Intensity Scale considers the reduction, or attenuation, of ground motion as the distance between source and site increase; the scale is calibrated from I to XII. For example, in a large earthquake, a site next to the fault may experience intensity IX shaking, while a site many miles away may experience only intensity VI shaking.

The Probable Maximum Loss has then been estimated utilizing the damage prediction method developed by Messrs. Charles C. Thiel, Jr. and Theodore C. Zsutty, (see "Earthquake Spectra" Vol. 3, No. 4: Nov. 1987 titled Earthquake Characteristics and Damage Statistics) in addition to ground fault and acceleration data from the USGS database, and EQFAULT and FRISKSP seismic hazard analysis computer programs.

The largest magnitude and most destructive earthquake recorded in the vicinity of this site occurred about 4 miles away on March 11, 1933. This event, the Long Beach Earthquake, registered a magnitude 6.3 on the Richter Scale and produced damage on the order of MMI XI in the vicinity of this site. Another significant seismic event occurred about 6 miles away from this site on March 11, 1933. This event, the Long Beach Earthquake aftershock, had an estimated magnitude of 5.2 and resulted in MMI level IX damage in the areas surrounding this site.

From 1900 to 2000, there were 34 recorded seismic events within a 50-mile radius of this site, with Richter magnitudes ranging from of 5.0 to 6.3 and corresponding MMIs ranging from IV to XI. The *Newport-Inglewood (L.A. Basin) Fault* is closest known fault to the site and it is located about 2 miles away. Closest historical earthquake was about 4 miles away from this site in 1933.

The Modified Mercalli Intensity (MMI) for this site is VIII. An abridged version of the Modified Mercalli Intensity Scale is included in the Appendix.

4.2 PROBABLE MAXIMUM LOSS

The Probable Maximum Loss (PML) is the amount of damage the property might suffer as a result of the occurrence of the probable earthquake scenario at any time, regardless of the anticipated probability of such an event. This PML has been estimated and formulated such that it will not be exceeded in 90% of the buildings of a given class or nine out of ten buildings. The PML is expressed as a damage ratio, which is defined as the approximate repair cost resulting from the subject earthquake divided by the replacement cost of the buildings. Replacement costs do not include the value of the land, nor do they refer to the market value of the property.

For the PML value, please refer to Section 5.0 below and the Executive Summary above.

5.0 CONCLUSIONS

Based upon our site assessment of November 4, 2003 and utilizing the USGS database and FRISKSP computer program, the PML for the subject Newport Marina Apartments (buildings), constructed in 1959, is estimated at **18%** of the replacement cost of the buildings. This estimate is based on a 475-year return period and 10% chance of exceedance in a 50-year exposure period.

The buildings appear to have been provided with the basic lateral load resisting system for Seismic Zone 4.

Appendix A

Modified Mercalli Intensity Scale
Seismic Zone Map of the United States

MODIFIED MERCALLI INTENSITY SCALE (1931 ABRIDGED)

I.	Not felt except by a very few under especially favorable circumstances
II.	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing
III.	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibration likes passing of truck. Duration estimated
IV.	During the day felt by many, felt outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably
V.	Felt by nearly everyone; many awakened. Some dishes, windows, etc. broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop
VI.	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight
VII.	Everybody runs outdoors. Damage negligible in buildings of ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimney, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Disturbs persons driving motor cars
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken
X.	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks
XI.	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly
XII.	Damage total. Waves seen on ground surfaces. Lines of sight and level distorted. Objects thrown upward into the air

1997 UNIFORM BUILDING CODE

FIGURE 16-2

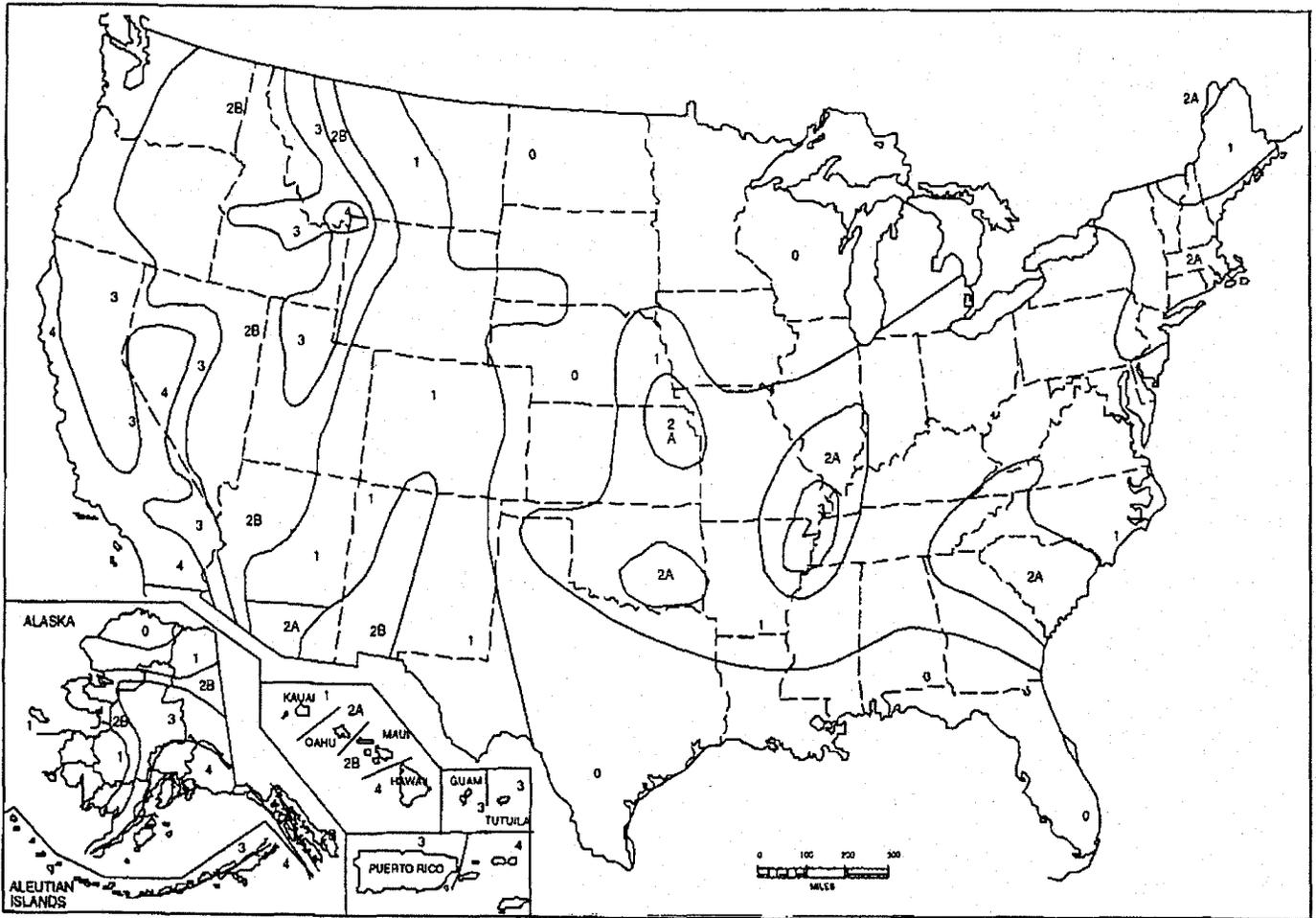
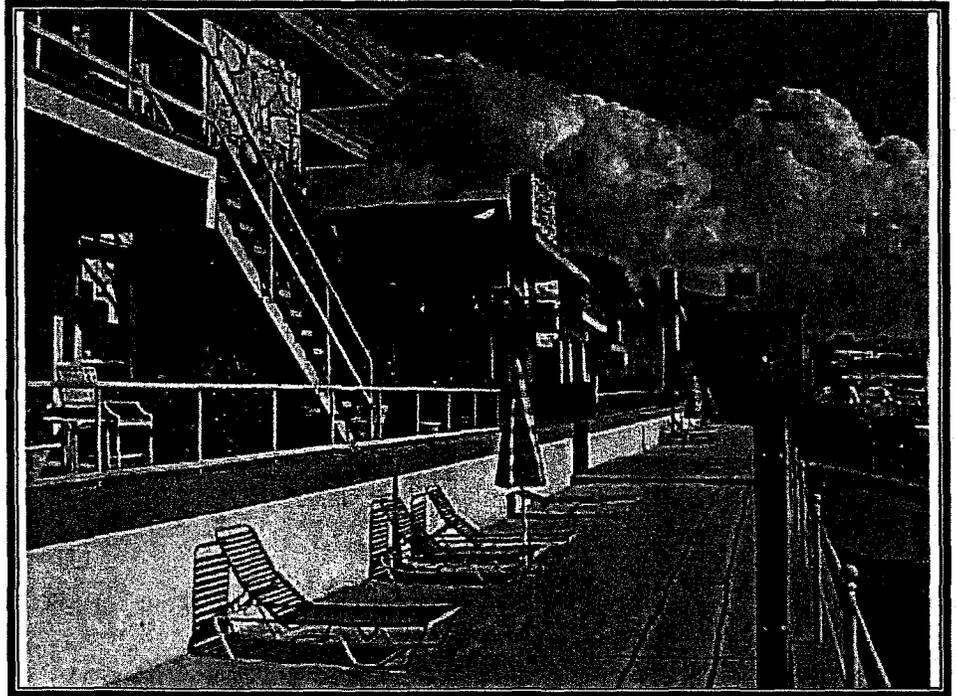


FIGURE 16-2—SEISMIC ZONE MAP OF THE UNITED STATES
For areas outside of the United States, see Appendix Chapter 16.



National Environmental
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PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT



NEWPORT MARINA APARTMENTS
919 BAYSIDE DRIVE
NEWPORT BEACH, CALIFORNIA 92660

EBI Project #23-2629A

November 18, 2003

Prepared for:

CHINATRUST BANK
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PROJECT #23-2629A**

PHASE I ENVIRONMENTAL SITE ASSESSMENT

***Newport Marina Apartments
919 Bayside Drive
Newport Beach, California 92660***

November 18, 2003

Prepared for:

**Chinatrust Bank
c/o Johnson Capital iCap
18101 Von Karman Ave.
Suite 1050
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ENVIROBUSINESS, INC.
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November 14, 2003

Ms. Victoria Castillo
Chinatrust Bank
c/o Johnson Capital iCap
18101 Von Karman Ave.
Suite 1050
Irvine, CA 92612

**Subject: Phase I Environmental Site Assessment Report, Newport Marina Apartments
919 Bayside Drive, Newport Beach, California 92660
EBI Project #23-2629A**

Dear Ms. Victoria Castillo:

Attached please find our *Phase I Environmental Site Assessment Report*, (the *Report*) for the above-mentioned asset (the Subject Property). During the property survey and research, our property surveyor met with agents representing the Subject Property, or agents of the owner, and reviewed the property and its history. The *Report* was completed according to the terms and conditions authorized by you. This *Report* has been completed in general conformance with the ASTM Practice E 1527.

The purpose of this *Report* is to assist *Chinatrust Bank*, in its underwriting of a proposed mortgage loan on the Subject Property described herein.

This Report is addressed to *Chinatrust Bank* and such other persons as may be designated by *Chinatrust Bank* and their respective successor or assign.

Reliance on the *Report* and the information contained herein shall mean (i) the *Report* may be relied upon by *Chinatrust Bank* in determining whether to make a loan evidenced by a note secured by the Property ("the Mortgage Loan"); (ii) the *Report* may be relied upon by any loan purchaser in determining whether to purchase the Mortgage Loan from *Chinatrust Bank* or an interest in the Mortgage Loan or securities backed or secured by the Mortgage Loan, and any rating agency rating securities representing an interest in the Mortgage Loan or backed or secured by the Mortgage Loan; (iii) the *Report* may be referred to in and included, in whole or in part, with materials offering for sale the Mortgage Loan or an interest in the Mortgage Loan or securities backed or secured by the Mortgage Loan; (iv) the *Report* speaks only as of its date in the absence of a specific written update of the *Report* signed and delivered by EBI Consulting.

There are no intended or unintended third party beneficiaries to this *Report*, unless specifically named.

EBI is an independent contractor, not an employee of either the issuer or the borrower, and its compensation was not based on the findings or recommendations made in the *Report* or on the closing of any business transaction.

Thank you for the opportunity to prepare this *Report*, and assist you with this project. Please call us if you have any questions or if we may be of further assistance.

Respectfully Submitted,

Mr. Brian Smith
Author/ R.A.

Ms. Kati Steiner
Reviewer/Program Director
Direct# 480-460-9116

Mr. Tim Hasselbach
Vice President

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WARWICK, RI

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EXECUTIVE SUMMARY

The Subject Property, known as Newport Marina Apartments includes a 64-unit apartment complex with 14 two-story buildings and three single-story garage buildings, located on an approximate 4.035 acre lot. It was reportedly constructed in phases with buildings A-M in 1959 and buildings N-O in 1975.

The property is located in Newport Beach, California at 919 Bayside Drive. Newport Beach is a coastal city located in Orange County in southern California, and the Subject Property is approximately one mile north of downtown Newport Beach. The current tenancy is multi-family residential use.

Mr. Brian Smith of EBI surveyed the property on November 11 and 12, 2003. He was accompanied by and interviewed Ms. Kathleen Gatchell, the Community Manager and Mr. Peter Ruiz, the property maintenance manager. At the time of the survey, the weather was partly cloudy and approximately 70° Fahrenheit. During the survey, representative common areas, apartments, mechanical spaces and/or equipment and building components were observed. Approximately 10% of the units were surveyed. A Pre-Survey Questionnaire was forwarded to the designated property contact and has not been received as of this review.

Below is the Assessment Summary presenting our recommended actions for the Subject Property. Additional detail regarding each recommended action is provided in *Section 7.0*.

ASSESSMENT SUMMARY TABLE				
REPORT COMPONENT	SECTION (S)	CONCERN NOTED OR REPORTED	RECOMMENDED ACTIONS	ESTIMATED COST
Current Tenant or Property Use Concerns	3.2		No Further Action	
ASTs/USTs	3.3		No Further Action	
Potential Asbestos Containing Material (ACM)	3.4	✓	Develop and implement an asbestos operations and maintenance plan	\$500 to write the O&M Plan
Radon	3.5		No Further Action	
Lead-based Paint	3.6	✓	Develop and implement an LBP operations and maintenance plan	\$500 to write the O&M Plan
Lead in Water	3.7		No Further Action	
Potential PCB-containing Equipment	3.10		No Further Action	
Historical Use of Subject Property	4.0		No Further Action	
Potential Off-site Sources	3.12, 5.0		No Further Action	
Federal, State and Local Agency Concerns	5.2, 5.3, 5.4		No Further Action	

1.0 PURPOSE & LIMITATIONS

The primary purpose of this *Phase I Environmental Site Assessment Report* (the *Report*) is to assist *Chinatrust Bank*, in its underwriting of a proposed mortgage loan on the Subject Property, and to identify *recognized environmental conditions* in connection with the Subject Property described in this *Report*. Reliance upon this *Report* does not extend to property owners, or entities or individuals interested in purchasing the Subject Property. EBI's liability to a purchaser wishing to use this *Report* is limited to the cost of the *Report*. Amendments to EBI's limitations as stated herein that may occur after issuance of the *Report* are considered to be included in this *Report*. Payment for the *Report* is made by, and EBI's contract and *Report* extends to *Chinatrust Bank* only, in accordance with our *Standard Conditions For Engagement and, Authorization Letter and Agreement for Environmental Services*.

The additional purpose of this *Report* is to assess a parcel of *real estate* with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and *petroleum products*. As such, this practice is intended to permit a *Chinatrust Bank* to satisfy one of the requirements to qualify for the *innocent landowner defense* to CERCLA liability: that is, the practices that constitute "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 USC § 9601(35)(B).

In defining a standard of good commercial and customary practice for conducting an *environmental site assessment* of a parcel of *property*, the goal of the processes established by this practice is to identify *recognized environmental conditions*. The term *recognized environmental conditions (RECs)* means the presence or likely presence of any *hazardous substances* or *petroleum products* on a *property* under conditions that indicate an existing release, a past release, or a material threat of a release of any *hazardous substances* or *petroleum products* into structures on the *property* or into the ground, ground water, or surface water of the *property*. The term includes *hazardous substances* or *petroleum products* even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *RECs*.

EBI has performed this *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM Practice E 1527. This *Report* was prepared with no exceptions or deletions from ASTM Standard E1527.

SCOPE OF WORK

This *Report* was prepared for the use of *Chinatrust Bank*. This *Report* has been prepared in accordance with our *Standard Conditions For Engagement and Authorization Letter and Agreement for Environmental Services* approved and signed by *Chinatrust Bank*, and with the limitations described below, all of which are integral parts of this *Report*. A copy of the signed *Standard Conditions For Engagement and Authorization Letter and Agreement for Environmental Services* is maintained at the EBI Consulting's, Burlington, Massachusetts office.

The information reported was obtained through sources deemed reasonably ascertainable, as defined in ASTM E1527-00; a visual site survey of areas readily observable, easily accessible or made accessible by the property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property. Municipal information was obtained through file reviews of reasonably ascertainable standard government record sources, and interviews with the authorities having jurisdiction over the property. Findings, conclusions and recommendations included in the *Report* are based on our visual observations in the field, the municipal information reasonably obtained, information provided by the Client, and/or a review of readily available and supplied drawings and documents. No disassembly of systems or building components or physical or invasive testing was performed. EBI renders no opinion as to the property condition at un-surveyed and/or inaccessible portions of the Subject Property, which are described below. EBI relies completely on the information, whether written, graphic or verbal, provided by the property contact or as shown on any documents reviewed or received from the property contact, owner or agent, or municipal source, and assumes that information to be true and correct. The observations in this *Report* are valid on the date of the survey. EBI uses the reported date of construction to establish the Subject Property age.

The observations in this *Report* are valid on the date of the investigation. Where access to portions of the Subject Property or to structures on the Subject Property was unavailable or limited, EBI renders no opinion as to the presence of petroleum products or hazardous substances in that portion of the Subject Property or structure. In

addition, EBI renders no opinion as to the presence of, or indirect evidence relating to, petroleum products or hazardous substances where direct observation of the interior walls, floor, or ceiling of a structure was obstructed by objects or coverings on or over these surfaces.

The conclusions provided by EBI are based on the information obtained by visual survey of the Subject Property, and information provided by agents representing the Subject Property, or agents of the owner. In addition, EBI has relied on certain information provided by state and other referenced parties, and on information contained in the files of federal, state and/or local agencies available to EBI at the time of the assessment. Although there may have been some degree of overlap in the information provided by these various sources, EBI did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of these *Environmental Services*.

It is acknowledged that EBI judgments shall not be based on scientific or technical tests or procedures beyond the scope of the Services or beyond the time and budgetary constraints imposed by the Client. It is acknowledged further that EBI conclusions shall not rest on pure science but on such considerations as economic feasibility and available alternatives. Client also acknowledges that, because geologic and soil formations are inherently random, variable, and indeterminate in nature, the Services and opinions provided under this Agreement with respect to such Services, are not guaranteed to be a representation of actual conditions on the Subject Property, which are also subject to change with time as a result of natural or man-made processes, including water permeation. In performing the Services, EBI shall use that degree of care and skill ordinarily exercised by environmental consultants or engineers performing similar services in the same or similar locality. The standard of care shall be determined solely at the time the Services are rendered and not according to standards utilized at a later date. The Services shall be rendered without any other warranty, expressed or implied, including, without limitation, the warranty of merchantability and the warranty of fitness for a particular purpose.

Client and EBI agree that to the fullest extent permitted by law, EBI shall not be liable to Client for any special, indirect or consequential damages whatsoever, whether caused by EBI'S negligence, errors, omissions, strict liability, breach of contract, breach of warranty or other cause of causes whatsoever.

The ASTM Standard E1527 does not encompass analytical testing to evaluate Asbestos Containing Materials (ACM), radon, lead-based paint (LBP), drinking water quality, indoor air quality, stored chemicals, debris, fill materials, surface water, or subsurface samples (soil and groundwater) as part of a Phase I ESA. EBI performed testing at the Subject Property in accordance with the *Standard Conditions For Engagement* and, *Authorization Letter and Agreement for Environmental Services* and the client specific *Scope of Work*. Unless otherwise specified herein, such testing involves screening methods intended to provide a broad and approximate evaluation of conditions at readily accessible portions of the Subject Property, limited by project constraints, and should not be construed as a comprehensive program designed to comply with a specific regulatory program. If a thorough and regulatory-compliant study is warranted based on the findings of the Phase I ESA, EBI will recommend the appropriate further investigation. In certain cases, quantitative laboratory testing is performed as part of the assessment and analyses have been conducted by an outside laboratory. EBI relies upon the data provided by the outside laboratory, and has not conducted an independent evaluation of the reliability of this data.

The assessment was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The *Report* speaks only as of its date, in the absence of a specific written update of the Report, signed and delivered by EBI.

Additional information that becomes available after our survey and draft submission concerning the Subject Property should be provided to EBI so that our conclusions may be revised and modified if necessary, at additional cost. This *Report* has been prepared in accordance with our *Standard Conditions for Engagement*, which is an integral part of this *Report*.

INACCESSIBLE OR UN-SURVEYED PORTIONS OF SUBJECT PROPERTY

EBI was not provided with access to a unnoticed resident dwelling units. EBI viewed a total of seven units including 100 percent of vacant units. Units observed were units N-4, M-3, O-5, F-1, B-4, H-4, and D-2. Remaining 57 units were not accessible. There were no other notable portions of the Subject Property excluded from this survey.

ABBREVIATIONS

EBI may use various abbreviations to describe various site, building or system components or legal descriptions. Not all abbreviations may be applicable to all reports. The abbreviations most often utilized are defined below.

ACM	Asbestos-containing material	HVAC	Heating, ventilating and air conditioning
AST	Aboveground storage tank	MSDS	Material Safety Data Sheet(s)
CMU	Concrete masonry unit	REC	Recognized environmental condition
EIFS	Exterior insulating finishing system	RTU	Rooftop unit
FOIA	Freedom of Information Act	UST	Underground storage tank
LBP	Lead-based paint	VCT	Vinyl composition tile

2.0 SUBJECT PROPERTY CHARACTERISTICS

2.1 OWNERSHIP AND LOCATION

According to the Orange County Assessor's Office and Ms. Gatchell, the Community Manager, the Subject Property is owned by the *Irvine Company dba Newport Marina LLC*. The Subject Property is described as Assessor's Parcel 050-442-05 with a legal description of Parcel Map 185-09 Parcel 1 and Irvine Subdivision Portion of Block 94. A copy of the parcel map is appended.

The property is located in Newport Beach, California at 919 Bayside Drive. The Subject Property is fronted on the north by Bayside Drive and is approximately 800 feet south of the Pacific Coast Highway also known as California Highway 1. *Figure 1, Location Map* attached to this Report depicts the Subject Property on a street map of the vicinity.

Figure 2, Topographic Map attached to this Report depicts the Subject Property on a portion of the *Newport Beach, California* United States Geological Survey (USGS) Topographic Quadrangle.

2.2 DESCRIPTION AND OPERATIONS

LAND AND BUILDING AREAS

The Subject Property includes 17 buildings and numerous boat berths located in the channel south of the developed lands. Fourteen of the buildings (identified as Buildings A through O) are two-story used for multi-family residential. Three buildings are single-story and used for garage parking. Building M has dwelling spaces on the second story and tuck-under garage spaces on the ground floor. The buildings are located on an irregular shaped and slightly sloping 4.035-acre parcel. The Subject Property includes a boat dock area with 22 berths and outdoor fountain.

The remainder of the Subject Property includes asphalt paved parking and access/driving lanes, concrete paving including pedestrian walkways, beach area between the seawall and the boat dock/berth areas, and a centrally located swimming pool.

CURRENT TENANTS AND USE OF THE PROPERTY

At the time of EBI's survey, residential tenants occupied the Subject Property. EBI was provided with a copy of the most recent rent roll, which is appended to this Report.

The current tenancy of the Subject Property is residential. According to the site contact one of the 64 units is unoccupied. There are currently no commercial or industrial operations at the Subject Property.

2.3 MUNICIPAL SERVICES & UTILITIES

2.3.1 Water & Sewer

Domestic drinking water is provided by the *Newport Beach Water Department*. The drinking water source is reportedly a combination of treated surface and groundwater supplied by both by the Southern California Metropolitan Water District, the Orange County Metropolitan Water District and the City of Newport Beach. According to personnel at this Department, water is monitored and tested quarterly. It was reported to EBI that drinking water quality meets federal and state standards. A copy of the 2003 Water Quality Report is appended.

The City of Newport Beach provides sewer services to the Subject Property. The buildings were connected to the municipal sewer system at the time of construction in 1959 and 1975, respectively.

2.3.2 Gas/Oil

Southern California Gas provides gas service to the Subject Property. Gas fuels the individual wall or forced-air furnaces, which subsequently heat the individual units. No oil service is provided to the Subject Property.

2.3.3 Electrical

Edison supplies electrical service to the Subject Property. Several vault-located and one pad-mounted transformers, owned by the utility, were noted throughout the Subject Property.

3.0 SUBJECT PROPERTY RECONNAISSANCE

3.1 INTERIOR SURVEY

The following table summarizes issues on which the survey of interior areas of the Subject Property focused:

INTERIOR SURVEY		
ITEM	NOTED	LOCATION AND DESCRIPTION
Processes that generate Petroleum Products or Hazardous Substances		N/A
Unusual odors		N/A
Pools of liquid		N/A
Containers not attributed to current use of the Subject Property		N/A
Stains or corrosion		N/A
Drains and Sumps		N/A
Oil-containing equipment		N/A

3.2 USAGE, HANDLING AND DISPOSAL OF PETROLEUM PRODUCTS AND/OR HAZARDOUS SUBSTANCES

Routine quantities of hazardous chemicals, oils, and lubricants are used to maintain the Subject Property. These materials include cleaning compounds, paints, thinners, gasoline and joint compounds. These materials are stored in maintenance closets in various buildings. Materials observed at the Subject Property are utilized during routine operations and do not result in the generation of regulated waste. No evidence of significant leaks or spills was noted during EBI's site visit.

No indication of leaks, spills or improper handling of petroleum or hazardous substances that might impact the environmental condition of the Subject Property was noted. Note that a compliance audit was beyond the scope of this assessment and was not performed.

3.3 ABOVEGROUND/UNDERGROUND STORAGE TANKS (ASTs/USTs)

Based on observations, interviews and a review of state and local records, there are no indications of ASTs or USTs located at the Subject Property.

3.4 ASBESTOS-CONTAINING MATERIAL (ACM)

The use of asbestos in many building products was banned by the U.S. Environmental Protection Agency (EPA) by the late 1970s. In 1989, EPA issued a ruling prohibiting the manufacturing, importation, processing, and distribution of most asbestos containing products. This rule, known as the Ban & Phase-Out Rule, would have effectively banned the use of nearly 95% of all asbestos products used in the United States. However, the U.S. 5th Circuit Court of Appeals vacated and remanded most of the Ban and Phase Out Rule in October 1991. Due to this court decision, many asbestos containing product categories

not previously banned (prior to 1989) may still be in use today. Among these common material types found in buildings are floor tile and roofing materials.

ACM represents a concern when it is subject to damage that results in the release of fibers. Friable ACM, which can be crumbled by hand pressure and is therefore susceptible to damage, is of particular concern. Non-friable ACM is a potential concern if it is damaged by maintenance work, demolition or other activities.

The previous ESA cited in *Section 4.1* of this Report included documentation of a limited asbestos survey at the Subject Property. The 2000 survey detected asbestos in stucco and spray-applied acoustic ceiling texture at the Subject Property. According to the Subject Property representative, an asbestos Operations and Maintenance (O&M) Plan is not currently in place but awareness documentation is provided to residents at the time of rental. According to property representatives no removal of suspected or identified ACM has been performed.

EBI observed friable potential ACM in the form of textured ceiling surfacing and non-friable potential ACM in the form of vinyl floor tile and construction mastics at the Subject Property. Where observed, the potential ACM is intact and in good condition except in the laundry room of Building G, in which some of the ceiling surfacing exhibits water damage. Other minor damaged ceiling material was observed in the form of disturbed holes where fixtures were previously mounted. It should be noted that additional potential ACM may be present in portions of the structure that are not accessible, such as behind walls and above ceilings.

The buildings were constructed in 1959 and 1975. As directed by the *Scope of Work* for this project, EBI collected ten representative samples of potential ACM in the form of insulation, ceiling surfacing material and drywall. Potential ACM samples were submitted to Environmental Hazards Laboratory in Richmond, VA to be tested for the presence of asbestos by polarized light microscopy (PLM). The following table below presents the results of the testing.

ASBESTOS SAMPLING RESULTS						
SAMPLE ID	LOCATION	MATERIAL	% ASBESTOS	FRIABLE?	CONDITION	ESTIMATED AMOUNT
AC 1	Unit O-5	Duct Insulation	No asbestos detected (NAD)	No	Good	50 square feet
AC 2	Unit F-1	Duct Insulation	NAD	Yes	Good	NA
AC 3	Unit O-5	Drywall	<1% Chrysotile in texture 3% Chrysotile present in joint compound.	No	Good	13,000 SF over all 64 units
AC 4	Maintenance Room Wall	Plaster	NAD	No	NA	NA
AC 5	Exterior Wall Building L	Stucco	NAD	No	NA	NA
AC 6	Unit O-5	Ceiling surfacing	3% Chrysotile	Yes	Good	70,000 SF over 64 units
AC 7	Unit H-4	Duct Insulation	NAD	Yes	Good	NA
AC 8	Unit H-4	Ceiling surfacing	7% Chrysotile asbestos	Yes	Good	70,000 SF over 64 units

ASBESTOS SAMPLING RESULTS						
SAMPLE ID	LOCATION	MATERIAL	% ASBESTOS	FRIABLE?	CONDITION	ESTIMATED AMOUNT
AC 9	Laundry Room Ceiling panel	Ceiling material	NAD	Yes	Good	NA
AC 10	Pool utility room	Wall Insulation	NAD	Yes	Good	NA

As noted, ceiling surfacing and drywall were found to contain asbestos. These materials were observed to be in good condition. The analytical data report is attached to this Report.

It should be noted that the visual asbestos screening survey conducted under the scope of this investigation does not constitute a full asbestos inspection, in which all areas of the buildings would have been thoroughly surveyed and sampled. The possibility exists for ACM to be present in areas of the buildings not accessed or sampled by EBI personnel.

3.5 RADON

Radon is a naturally-occurring, colorless and odorless radioactive gas that is generated primarily in granitic rocks. The United States Surgeon General has published information that radon is a major cause of lung cancer. Radon usually enters a building through openings in the foundation, and therefore is a potential health concern to occupants of the lowest level of a building with inadequate ventilation.

The EPA Map of Radon Zones indicates County is in a Zone 3 radon area. Zone 3 is defined as areas that have a low potential for radon gas with levels <2.0 pCi/L. The EPA guideline for radon is 4.0 pCi/L. In accordance with the *Scope of Work*, a limited radon screening was not performed at the Subject Property.

3.6 LEAD-BASED PAINT (LBP)

Use of lead in household paint was banned by the Environmental Protection Agency (EPA) effective January 1, 1978. The EPA considers paint containing greater than 0.5% lead by weight to be "lead-based." Federal regulations specify that lead paint hazards must be abated in residential buildings occupied by children under the age six.

Based on the dates of construction (1959 and 1975), a limited qualitative lead screening was performed on selected painted surfaces at the Subject Property. The purpose of this screening was to obtain qualitative information that may indicate the presence of lead on selected painted surfaces. Quantitative lead analysis should be performed by a qualified firm in order to confirm the results indicated herein. This screening is not designed to meet the requirements of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X), or any other applicable regulatory requirements; rather, it is intended to give the Lender an indication of the likelihood that lead-based paint is present. The property falls under the definition of Target Housing, and is regulated under Title X. Regardless of the findings of this limited screening, the seller or renter of the property is required to make available a federally approved lead hazard information pamphlet and must disclose known lead-based paint and/or lead-based paint hazards to purchasers and renters of the property pursuant to the requirements of 24 CFR 35.92 and 40 CFR 745.113.

Ms. Kathleen Gatchell, Property Manager, stated that procedures have been established at the Property to ensure the tenants are provided with the required Lead Based Paint Notices. A copy of one of the notices is appended to this Report.

The painted surfaces observed at the Subject Property were in good to fair condition. Areas of chipping or peeling paint were sampled for the presence of lead by applying a colorimetric lead-sensitive chemical Lead Check Reaction Swabs (LCRS) to the painted surface. If the color of the applicator turns pink, the screen is positive, and the presence of lead is indicated. LCRS cannot determine the percentage or amount of lead in paint for purposes of comparing to regulatory levels. Detectable concentrations of lead were found in some of the areas tested and samples at these locations were taken. The sample locations and analysis results are listed in the table below:

LEAD BASED PAINT SAMPLING RESULTS		
SAMPLE #	SAMPLE LOCATION	LCRS RESULT
LBP-01	Apartment Unit F-1 door jamb	Positive
LBP-02	Building O stair handrail	Positive
LBP-03	Building L wood trim at railing	Positive
LBP-04	Apartment Unit H-4 furnace closet door jamb	Positive
LBP-05	Apartment Unit H-4 closet	Positive
LBP-06	Apartment Unit H-4 bedroom door jamb	Positive
LBP-07	Apartment Unit L-3 door jamb	Positive
LBP-08	Building H wood trim	Positive
LBP-09	Apartment Unit F-1 window sill	Negative
LBP-10	Apartment Unit F-1 bedroom door jamb	Negative
LBP-11	Building D handrail	Negative
LBP-12	Apartment Unit D-2 window sill	Negative
LBP-13	Apartment Unit D-2 bedroom door jamb	Negative
LBP-14	Building O handrail	Negative

The painted surfaces observed at the Subject Property were in good to fair condition. EBI collected 4 interior and 4 exterior paint chip samples to send to a State-certified laboratory for lead testing. Only one of the eight paint samples submitted for analysis contained lead in a concentration greater than the EPA threshold value of 0.5% lead by weight. The sample locations and analysis results are listed in the Table below:

LEAD BASED PAINT SAMPLING RESULTS		
SAMPLE #	SAMPLE LOCATION	LEAD CONTENT (% DRY WEIGHT)
LBP-01	Apartment Unit F-1 door jamb	1.8
LBP-02	Building O stair handrail	0.22
LBP-03	Building L wood trim at railing	0.077
LBP-04	Apartment Unit H-4 furnace closet door jamb	0.17
LBP-05	Apartment Unit H-4 closet	0.30
LBP-06	Apartment Unit H-4 bedroom door jamb	0.11
LBP-07	Apartment Unit L-3 door jamb	0.24
LBP-08	Building H wood trim	0.10

Note that the lead paint screening conducted under the *Scope of Work* of this assessment does not constitute a full compliance lead inspection in which all areas of the buildings and representative surfaces would have been tested. LBP may be present in areas of the buildings not sampled as part of the screening survey.

3.7 LEAD IN DRINKING WATER

Lead has historically been used in pipes, solder, and brass fixtures used in water distribution systems and plumbing material. In 1986, EPA banned the use of lead at concentrations exceeding 0.2% lead in solder and 8% lead in other plumbing material. The Newport Beach, California Water Department provides domestic water. According to personnel at the Newport Beach, California Water Department, potable drinking water is reportedly obtained from a combination of treated surface and groundwater supplied by both by the Southern California Metropolitan Water District, the Orange County Metropolitan Water District and the City of Newport Beach. According to personnel at this Department, water is monitored closely and tested quarterly. It was reported to EBI that drinking water quality meets federal and state standards. The most recent analytical testing data indicates compliance with Safe Drinking Water Act (SDWA) requirements.

According to personnel at the Newport Beach Water Department, the domestic water for the city meets the water quality standards as established by state and federal authorities. Lead in the domestic water supply is reportedly less than the method detection limit. In accordance with the *Scope of Work*, no water testing was performed at the Subject Property.

3.8 EXTERIOR SURVEY

The following table summarizes issues on which the survey of exterior areas of the Subject Property focused:

EXTERIOR SURVEY		
ITEM	NOTED	LOCATION AND DESCRIPTION
Storage tanks		N/A
Unusual odors		N/A
Areas of asphalt patch or surface depressions		N/A
Containers not attributed to current use of the Subject Property		N/A
Oil-containing equipment	✓	One pad-mounted transformer and four vault-located transformers are located on the Subject Property (see Section 3.10).
Stained soil or pavement		N/A
Stressed vegetation		N/A
Fill material of questionable origin/ Piles		N/A
Wastewater		N/A
Monitoring Wells		N/A
Catch basins or dry wells		N/A
Septic systems		N/A

3.9 SOLID WASTE DISPOSAL

Solid waste generated at the Subject Property is typical domestic waste consisting of paper, plastics, and food refuse. Solid waste is collected in four 5-yard steel rolling dumpsters located in enclosures throughout the Subject Property. No evidence of illicit dumping of solid waste was observed during EBI's site visit. CR&R Waster Services empties the dumpsters on an as needed basis.

3.10 POLYCHLORINATED BIPHENYLS (PCBS) EQUIPMENT

PCBs were used in the dielectric fluid of some transformers and capacitors manufactured prior to 1979. The EPA banned the use of PCBs in 1978.

Potential PCB-containing equipment observed at the Subject Property included pad-mounted and vault-located transformers. The transformers appeared to be in good condition and no indications of leaks or staining were observed on or below the transformer casings. The transformers are owned and operated by the regional utility company, *Edison*, which has indicated that none of its transformers contain PCBs. In the event of a release of dielectric fluid from one of its transformers, the utility company typically performs the cleanup.

The transformer vaults were sealed by the electric utility and was not accessible. In the event of a release of dielectric fluid from one of its transformers, the utility company typically performs the cleanup.

3.11 PHYSICAL SETTING

TOPOGRAPHY

The Subject Property is at an elevation of approximately 16 feet above mean sea level (msl). The Subject Property is tiered, and sloped down gently to the south. (see *Figure 2-Subject Locus Map*, which is a portion of the Newport Beach, California USGS Quadrangle). The overall slope of the surrounding area is down to the south.

GEOLOGY

Near-surface geology in heavily developed areas such as the Subject Property and vicinity is considered part of the Myford Association characterized by nearly level to moderately steep, moderately well drained sandy loams that have a strong developed subsoil; on terraces. The specific soil at the Subject Property within the Myford Association is classified as "115-Beaches" consisting of sandy, gravelly, or cobbly coastal shores that are washed and rewashed by tidal and wave action. These areas may be partly covered by water during high tides or stormy periods. They support little or no vegetation and have no agricultural value. Some are excellent recreational areas. Runoff is very slow, and erosion hazard is high. Present land use is recreation and urban development.

No bedrock outcroppings were noted at the Subject Property.

HYDROLOGY/HYDROGEOLOGY

No surface water bodies are present on the Subject Property. The nearest surface water is the Pacific Ocean in the form of Newport Bay. The Balboa and Promontory Channels are adjacent to the Subject Property on the south and west sides respectively.

The depth to groundwater is not known. Local groundwater gradient is expected to follow surface topography; therefore, groundwater flow near the Subject Property is expected to flow to the south.

Groundwater flow gradients are best evaluated by a subsurface investigation involving the installation of at least three groundwater monitoring wells and precise measurements of hydrostatic pressure. Monitoring wells were not observed on the Subject Property.

The previous environmental reports prepared by URS and Dames & Moore respectively did not discuss groundwater flows. Local groundwater gradient is typically expected to follow surface topography; however, the absence of a distinct ground surface slope at the Subject Property prevents estimation of groundwater flow direction by this method.

3.12 ADJACENT PROPERTIES

NORTH

The northern boundary of the Subject Property is adjacent to the frontage street, Bayside Drive. Beyond Bayside Drive is a shopping center known as Bayside Center with street addresses ranging from 900 to 1090 Bayside Drive that contains miscellaneous retail shops and restaurants. Beyond the shopping is an apartment complex known as Promontory Villa Apartments. No evidence of adverse environmental conditions was observed during the survey of the northern boundary of the Subject Property.

SOUTH

The Subject Property is bordered on the south by Balboa Channel, a waterway inlet considered part of Newport Bay. Balboa Island and residential dwellings are located beyond Balboa Channel. No evidence of adverse environmental conditions was observed during the survey of the northern boundary of the Subject Property.

EAST

The Subject Property is bordered on the east by a multi-family residential development known as The Cove with a street address of 1001 Bayside Drive. No evidence of adverse environmental conditions was observed during the survey of the eastern boundary of the Subject Property.

WEST

The Subject Property is bordered on the west by Promontory Channel, a waterway inlet considered part of Newport Bay. Harbor Island and residential dwellings are located beyond Promontory Channel. No evidence of adverse environmental conditions was observed during the survey of the northern boundary of the Subject Property.

4.0 SUBJECT PROPERTY AND VICINITY HISTORY

4.1 PREVIOUS ENVIRONMENTAL REPORTS

Johnson Capital provided EBI with two previous Environmental Site Assessments performed for the Subject Property:

Phase I Environmental Site Assessment, performed by URS/Dames & Moore, Inc. of Los Angeles, California, dated December 8, 2000. URS/Dames & Moore utilized the report prepared by Dames & Moore discussed below. The URS ESA, which was based on site visits performed on November 21, 2000 did not testing for radon, lead-based paint, or asbestos at the Subject Property. The conclusions presented in this report indicated "no recognizable environmental conditions" affecting the Subject Property and recommended "no further investigation."

Phase I Environmental Site Assessment, performed by Dames & Moore, Inc. of Los Angeles, California, dated October 25, 1999. The Dames & Moore ESA was based on a site visit dated October 13, 1999 and did not include testing for radon, lead-based paint or asbestos. The Dames & Moore ESA concludes, in part, that "no evidence of recognized environmental conditions were not identified due to current and past on site conditions. Dames & Moore does not recommend additional investigations of the properties at this time."

The relevant portions of the two reports are included as an Appendix to this Report.

4.2 FIRE INSURANCE MAPS

EBI attempted to review Sanborn Maps at the Orange County Park Central Library, the City of Newport Beach Library, and the Orange County Heritage Park Regional Library. No Sanborn map coverage was available for the Subject Property area.

4.3 HISTORIC AERIAL PHOTOGRAPHS

The previous ESAs cited above included reviews of aerial photos dated 1947, 1954, 1968, 1977, 1989 and 1994.

The 1947 photograph depicts the Subject Property as "a vacant beach", with no structures or other development. Adjacent properties were primarily a waterway to the south and west, undeveloped land to the east and the frontage street with undeveloped lands to the north.

The 1954 photograph is reported as unchanged from the previous photo.

The 1968 through 1994 photographs show the Subject Property to be developed. The 1968 photograph shows the majority of buildings and the remaining photos showing the entire facility completed with the current 17-building configuration. Adjacent development increased in density between the 1956 and 1994 photographs, resulting in the current conditions described in Section 2.4 of this Report.

Aerial photographs from 1938, 1953, 1963, 1972, 1985 and 1992 were available for the Subject Property vicinity and were reviewed by EBI from Rupp Aerial. A 1998 photograph available from the USGS was also reviewed.

The 1938 photograph shows the Subject Property as undeveloped beach lands. To the west was an apparent water inlet with harbor facilities. To the south was Balboa Channel with Balboa Island beyond. To the east were undeveloped beach lands. To the north was a frontage street and undeveloped beach lands beyond.

The 1953 photograph shows the Subject Property developed with several structures. According to EBI's review of building department records, these structures were associated with harbor boat sales. Adjacent properties appear unchanged from conditions visible in the 1938 photograph.

The 1963 photograph shows the Subject Property developed with the majority of current apartment structures including Buildings A-M. The property adjacent to the east appears developed with several buildings. Remaining adjacent properties appear unchanged from conditions observed in the 1953 photograph.

The 1972 photograph shows the Subject Property expanded on the west due to relocation and creation of what is now called Promontory Channel and on the north where the frontage street has been relocated northward to its present configuration. The property adjacent to the east appears as vacant land. Portions of the current shopping center across the frontage street are in place excluding the stand-alone restaurant and pads for the currently configured apartments. The remaining adjacent properties appear unchanged from conditions visible in the 1963 photograph.

The 1985, 1992 and 1998 photographs show the Subject Property and adjacent properties developed in their present configurations.

4.4 CITY DIRECTORIES

EBI attempted to review historical city directories at the Newport Beach Central Library, the Orange County Park Street Library, and the Orange County Heritage Park Regional Library. Directories were not available at either of these locations.

4.5 INTERVIEWS

The following comments were made or interviews conducted during the Subject Property survey.

INTERVIEW COMMENTS		
CONTACT	TITLE/COMPANY/ RELATION TO PROPERTY	DETAILS OF CONVERSATION
Ms. Kathleen Gatchell	Subject Property Manager, Western National Property Management	Ms. Gatchell stated that she has worked at the apartment complex for the past three years. During that period, she was not aware of USTs, chemical spills, emergency response incident or other conditions of potential environmental concern. Ms. Gatchell stated that previous information and site testing for asbestos and lead-based paint were performed. ACM was identified in exterior stucco and interior spray-applied acoustic ceiling textures as well as vinyl adhesives. Ms. Gatchell stated that as part of apartment unit renovations that older vinyl has been and is covered with newer vinyl. Ms. Gatchell also stated that ACM and LBP Awareness documents are provided to each tenant upon initial leasing and provided copies to EBI that have been appended.

Mr. Peter Ruiz	Maintenance Engineer	Mr. Ruiz stated that he has worked at the property for the past six years and that during that time hazardous materials stored or used on the Subject Property include those utilized by contracted pool service company and residential quantities of household cleansers and oils.
Staff	City of Newport Beach Planning Department	According to information at the Newport Beach Building Department, the Subject Property was formerly developed with facilities used for boat retail activities. In 1959 development of the current buildings was initiated.
Mr. Phil Brigrande	Orange County Archives-Old County Courthouse	According to Mr. Brigrande, the property first appears on the tax records in the late 1930s and was unutilized until the late 1940s in conjunction with marina activities (retail boat sales).

4.7 PROPERTY TAX RECORDS

The property card was obtained at the Orange County Assessor's Office. The property card indicates that Irvine Company owned the property since at least the 1940s and that the current owner continues to be Irvine Company dba Newport Marina, LLC. Assessor's Office records indicate that the buildings were constructed in 1959 and 1975.

4.8 OTHER HISTORICAL RECORDS

EBI reviewed various telephone directories at the Newport Beach Central Public Library. The Subject Property was listed under the heading "Apartments" in various directories dating to 1966.

Based on information from the Newport Beach Building Department, the initial building permit for the current development on the Subject Property was finalized in 1959 and that the buildings were developed for Volk-McClain Company and in 1975 for the McClain Development Company. The land is reportedly owned by Irvine Company and had historically been leased for development. There are no records of substantial construction or demolition at the Subject Property since the initial development. Records reviewed at the Newport Beach Building Department did not indicate that operations of environmental concern were previously conducted at the Subject Property.

5.0 REGULATORY INFORMATION

5.1 PROCEDURE

A review of databases maintained by state and federal offices was completed through Environmental Data Resources, Inc. (EDR) of Southport, Connecticut. The databases were searched for properties with reported environmental issues within radii specified by ASTM Standard E 1527-00, either by using geocoding information that identified the coordinates of the properties in the databases or by checking the street addresses of practically reviewable non-geocoded "orphan" properties within the same zip code. The database report is included as an appendix to this Report.

The database report identified 34 "orphan sites." Orphan sites are those facilities, which could not be mapped or geocoded due to inadequate address information. EBI attempted to locate these facilities via vehicular reconnaissance and interviews with personnel familiar with the area. Based on this research, EBI did not identify orphan sites within the specified radii.

5.2 FEDERAL OFFICE RECORDS

NATIONAL PRIORITY LIST (NPL) FACILITIES

The NPL Report, also known as the Superfund List, is an EPA listing of the nation's worst uncontrolled or abandoned hazardous waste facilities. Listing as a Superfund Site is primarily based on a score that the facility receives from the EPA's Hazard Ranking System. These facilities are targeted for possible long-term remedial action under the Superfund Act. The NPL indicated that no NPL facilities are located within one mile of the Subject Property.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION & LIABILITY INFORMATION SYSTEM (CERCLIS) AND CERCLIS - NO FURTHER REMEDIAL ACTION PLANNED (CERCLIS-NFRAP) FACILITIES

CERCLIS is a compilation of the facilities EPA has investigated or is currently investigating for a release or threatened release of hazardous substances. The updated EPA Superfund Program CERCLIS List indicates that no CERCLIS facilities are located within a one-half mile radius of the Subject Property. No CERCLIS-NFRAP facilities are listed to be adjacent to the Subject Property.

CORRECTIVE ACTION TRACKING SYSTEM (CORRACTS)

CORRACTS is a list of facilities that are found to have had hazardous waste releases and require Resource Conservation and Recovery Act (RCRA) corrective action activity, which can range from site investigations to remediation. According to the CORRACTS list, no CORRACTS facilities are located within a one-mile radius of the Subject Property.

RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM (RCRIS)

The RCRIS report of hazardous waste generators and treatment, storage, and disposal (TSD) facilities contains information pertaining to facilities that are required to register their hazardous waste activity under RCRA). According to the RCRIS list, no RCRA TSD facilities are located within one-half mile of the Subject Property.

RCRA hazardous waste generators are identified as Large Quantity Generators (LQGs), Small Quantity Generators (SQGs), or Conditionally Exempt Small Quantity Generators (CESQG). RCRA LQGs are identified as those facilities, which generate at least 1,000 kilograms (2,200 pounds) of non-acutely hazardous waste (or 1 kilogram of acutely hazardous waste) monthly. RCRA SQGs are identified as those facilities that generate less than 1,000 kilograms of non-acutely hazardous waste monthly. According to the RCRIS list, no RCRA facilities were identified adjacent to the Subject Property.

EMERGENCY RESPONSE NOTIFICATION SYSTEM (ERNS)

The ERNS is a national database used to collect information on reported releases of petroleum products or hazardous substances. The database contains information from spill reports made to federal authorities including the EPA, the U.S. Coast Guard, the National Response Center and the U.S. Department of Transportation. A review of this database was made in order to determine if any spills or incidents involving releases of petroleum products or hazardous substances have occurred at the Subject Property. According to this updated ERNS database, the Subject Property is not on file as being a release site.

5.3 STATE OFFICE RECORDS

STATE HAZARDOUS WASTE FACILITIES

The state list of hazardous waste disposal facilities indicates that no state hazardous waste facilities are located within one-half mile of the Subject Property.

LEAKING UNDERGROUND STORAGE TANKS (LUSTS)

According to the state LUST facility list, ten LUST facilities are located within a one-half mile radius of the Subject Property. Five of the sites are considered topographically up-gradient to the Subject Property and five are considered topographically down-gradient. Based on location the down-gradient sites are not considered RECs to the Subject Property. The following table presents the listed up-gradient facilities:

LEAKING UNDERGROUND STORAGE TANK FACILITIES				
NAME / ADDRESS	MAP ID#	DISTANCE / DIRECTION / GRADIENT	REPORT DATE / SUBSTANCE / MEDIA AFFECTED	STATUS
Former Shell Station 900 Coast Highway E Newport Beach, CA	8	0.20 miles north-northeast, up-gradient	1992 - Gasoline Soil and groundwater affected	Remedial Action Underway
Mobile Station #18-HND 1000 E Coast Highway Newport Beach, CA	D13	0.24 miles northeast, up- gradient	1992 Gasoline Soils only	Case Closed
Mobile #18-HND 1000 Coast Highway E Newport Beach, CA	D14	0.24 miles northeast, up- gradient	1982 Gasoline Soils only	Case Closed
Newport Auto Center 445 E. Pacific Coast Highway Newport Beach, CA	19	0.43 miles northwest, up- gradient	1992 - Gasoline Soil and groundwater affected	Remedial Action Underway
Newport Beach Cars LLC 455 E. Pacific Coast Highway Newport Beach, CA	25	0.46 miles northwest, up- gradient	1990 Gasoline Soils only	Case Closed

None of the LUST listings identified in the databases is suspected to have an adverse environmental impact on the Subject Property based on one or more of the following rationale: a) their distance from the Subject Property; b) their down/cross-gradient location with respect to the assumed shallow groundwater flow direction; c) the nature of the reported release (e.g., soil only); and/or d) their regulatory status (e.g., case closed, remediation action underway).

STATE REGISTERED UNDERGROUND STORAGE TANKS (USTS)

According to the state UST database, no active UST facilities are located adjacent to the Subject Property.

SOLID WASTE LANDFILLS

According to the updated State Active List of Solid Waste Landfill facilities, no reported landfills are located within one-half mile of the Subject Property.

CALIFORNIA HAZARDOUS MATERIALS INCIDENT REPORT SYSTEM (CHMIRS)

According to the state CHMIRS facility list, four facilities are located within a one-mile radius of the Subject Property. The following table presents the listed facilities:

CHMIRS			
NAME/ ADDRESS	OES CONTROL #	DISTANCE/ DIRECTION/ GRADIENT	ISSUE/STATUS
Not reported 301 E. Coast Highway Newport Beach, CA	9100733	Approximately 844 feet north, up-gradient	Single unreported substance leaked and completed in 1991.
Jim Grisit 829 Harbor island Drive, Newport Beach, CA	02-4296	Approximately 2,083 feet west, down-gradient	Substance leak from damaged boat during removal from water. Minor leakage on ground was foamed by Fire Dept. and substance in water was allowed to dissipate. Date of completion 8-8-2002.
Not reported 118 S. Bayfront Newport Beach, CA	98-0764	Approximately 2,314 feet west- southwest, down-gradient	Petroleum leak in waterway with approximate 1500 SF sheen from sunken boat.
Not reported 504 S. Bayfront Newport Beach, CA	98-2495	Approximately 2,379 feet southwest, down-gradient	1998, one-gallon motor oil leak from sunken boat. Spill contained and cleanup performed by responsible party.

None of the CHMIRS listings identified in the databases is suspected to have an adverse environmental impact on the Subject Property based on one or more of the following rationale: a) their distance from the Subject Property; b) their down/cross-gradient location with respect to the assumed shallow groundwater flow direction and/or c) their regulatory status (e.g., case closed, remediation action underway).

CORTESE

According to the State CORTESE facility list, four facilities are located within a one-half mile radius of the Subject Property. Three of these sites are considered either cross- or down-gradient of the Subject Property or beyond the study radius of one-half mile and are not believed to represent an environmental concern to the Subject Property. The following table presents the listed up-gradient facility:

CORTESE			
NAME/ ADDRESS	ID #	DISTANCE/ DIRECTION/ GRADIENT	ISSUE/STATUS
GW Cleanup-N.B., PCH 18-HN, 1000 Coast Highway Newport Beach, CA	B302583001	Approximately 1,250 feet northeast, up-gradient	Cleanup regarding discharge of materials considered hazardous.

The CORTESE listing identified in the databases is not suspected to have an adverse environmental impact on the Subject Property based on one or more of the following rationale: the distance from the Subject Property; and the regulatory status (cleanup).

5.4 LOCAL OFFICE RECORDS

Local offices consulted during the preparation of this *Report* included the Newport Beach Building, Planning, Engineering, and Fire Departments. No documented adverse environmental conditions or complaints were reported at the Subject Property and readily on file at these offices. The local offices did not contain records of spills or releases that had occurred at the Subject Property.

6.0 FINDINGS AND OPINIONS

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of the Subject Property. Any exceptions to, or deletions from, this practice are described in Section 1.0 of this Report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject Property except the following:

- Potential ACM were observed at the Subject Property. These materials were observed to be in generally good condition. Based on the construction dates (1959 and 1975), EBI collected samples of select materials for laboratory analysis. The samples were submitted to Environmental Hazards Services LLC for analysis of asbestos content by polarized light microscopy (PLM). Results of the asbestos survey identified ACM in ceiling and drywall materials. These materials were in good condition at the time of the survey.
- The lead paint screening conducted under the scope of this assessment identified the presence of lead in some of the surfaces.
- EBI collected eight paint chip samples to send to a State-certified laboratory for lead testing. One of the eight paint samples submitted for analysis contained lead in a concentration greater than the EPA threshold value of 0.5% lead by weight.

7.0 RECOMMENDATIONS

The following additional actions are recommended:

- Based upon the presence and good condition of identified asbestos containing materials (ACM) at the Subject Property, and the potential for additional ACM to be present at the Subject Property, EBI recommends the development and implementation of an asbestos Operations and Maintenance (O&M) Plan for the Subject Property. This O&M Plan provides the procedures and guidelines that, when used during facility cleaning, maintenance, and general operations, will minimize human exposure to asbestos fibers and minimize release of asbestos fibers to the environment. This O&M Plan is a long-term management approach. Estimated cost: \$500.
- Based upon the presence and condition of identified Lead-Based Paint at the Subject Property, EBI recommends the development and implementation of an Lead Based Paint Operations and Maintenance (O&M) Plan for the Subject Property. This O&M Plan provides the procedures and guidelines that, when used during facility cleaning, maintenance, and general operations, will minimize human exposure to LBP and minimize contact with and ingestion of LBP. This O&M Plan is a long-term management approach. Estimated cost: \$500.

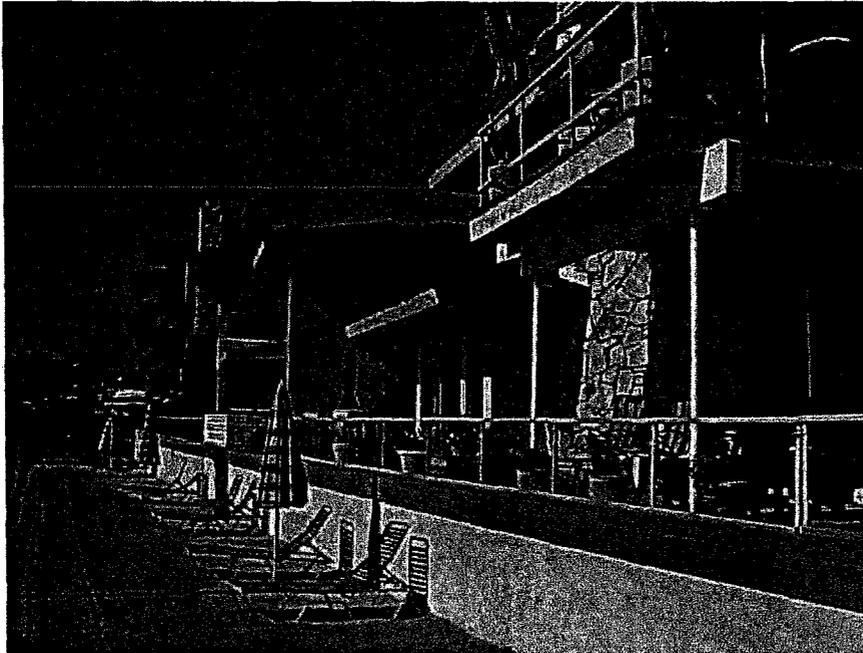
8.0 REFERENCES

8.1 REFERENCES CONTACTED

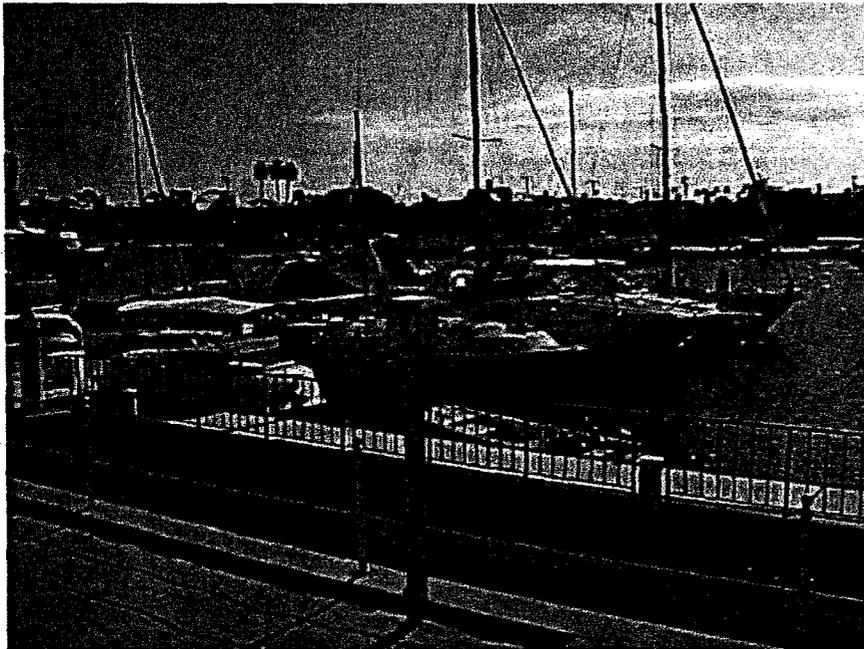
A number of sources were contacted during the preparation of this Report. The following individuals were interviewed, and state, county or local municipal departments consulted. Documentation applicable to the Subject Property in those departments was requested and reviewed when and where reasonably ascertainable, as detailed in ASTM E-1527-00. Individuals listed without phone numbers were contacted in person or by e-mail.

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT REFERENCES					
RESOURCE	ADDRESS	CONTACT	INFORMATION PROVIDED	PHONE OR WEB	DATE
City of Newport Beach Building Department	3300 Newport Blvd Newport Beach, California 92660	Ms. Susan McCourt	Code compliance & violations, Certificates of Occupancy	949-644-3389	11-12-03
City of Newport Beach Fire Department	3300 Newport Blvd Newport Beach, California 92660	File Review	Hazardous material, tank permit histories	949-644-3104	11-13-03
Orange County Assessor Archives	211 W. Santa Ana Suite 108 Santa Ana, CA 92701	Mr. Phil Brigrande	Property ownership & size information	714-834-2536	11-12-03
Orange County Assessors Office	12 Civic Center Suite 142 Santa Ana, CA 92702	File Review	Ownership History	714-834-2727	11-13-03
City of Newport Beach Utilities Department	3300 Newport Blvd Newport Beach, CA 92658	Public Document	Water Source Information	949-644-3011	11-13-03
Property Manager	919 Bayside Drive Newport Beach, CA 92660	Ms. Kathleen Gatchell	Property History	949-760-0919	11-12-03
Property Maintenance Manager	919 Bayside Drive Newport Beach, CA 92660	Mr. Peter Ruiz	Property History	949-760-0919	11-13-03

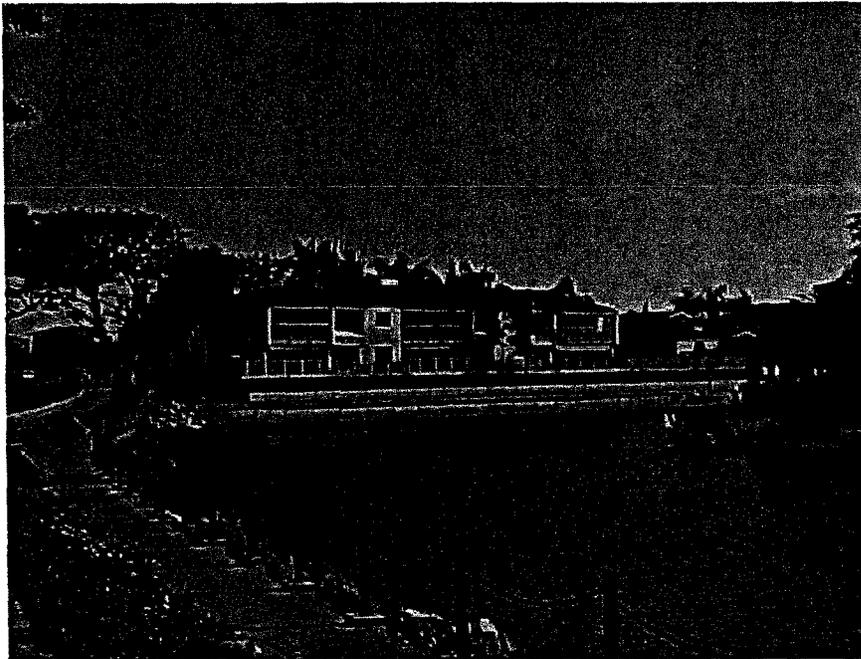
APPENDIX A
PHOTOGRAPHS



1. Subject Property viewed from Marina.



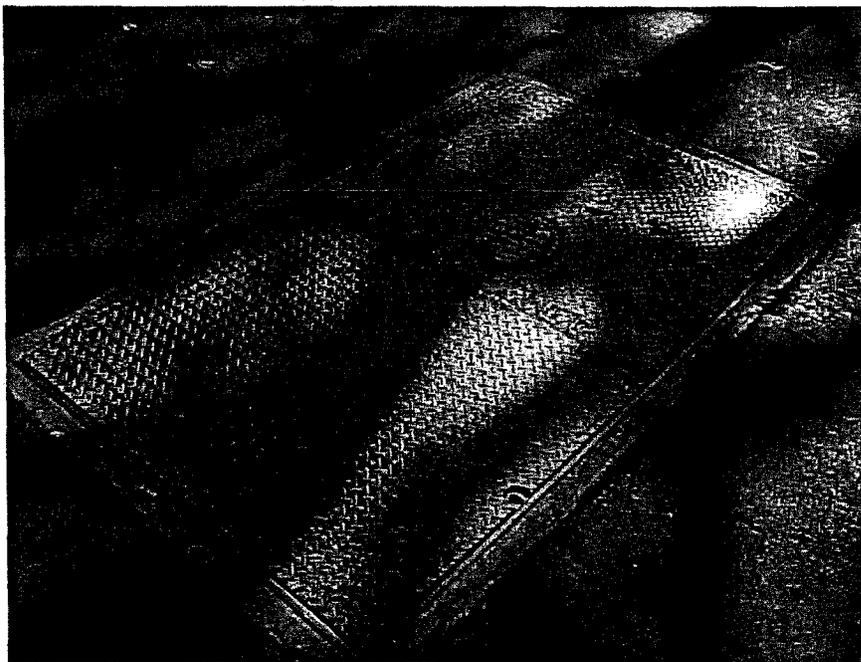
2. Marina portion of Subject Property.



3. View of Subject property from frontage street across Promontory Channel.



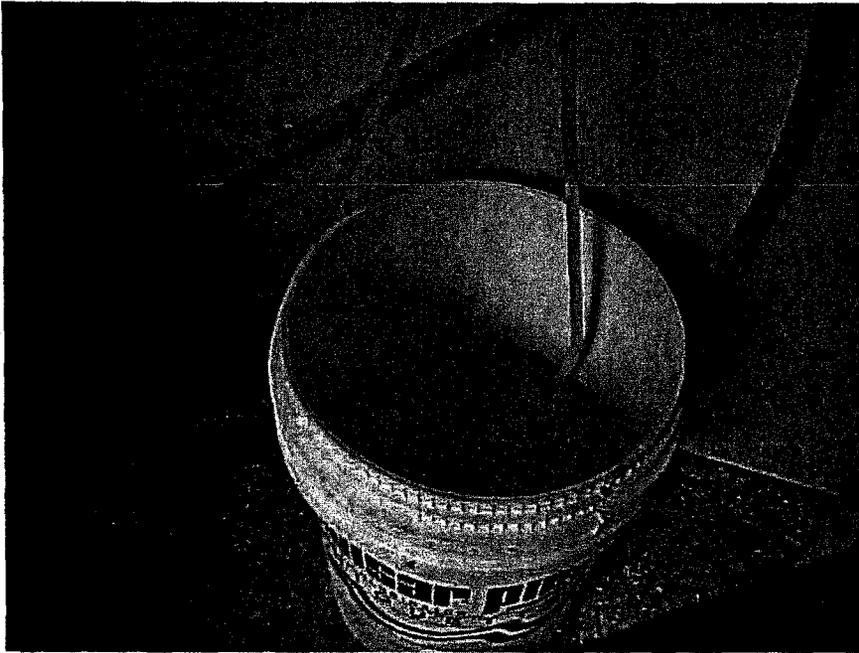
4. Unit interior at bedroom.



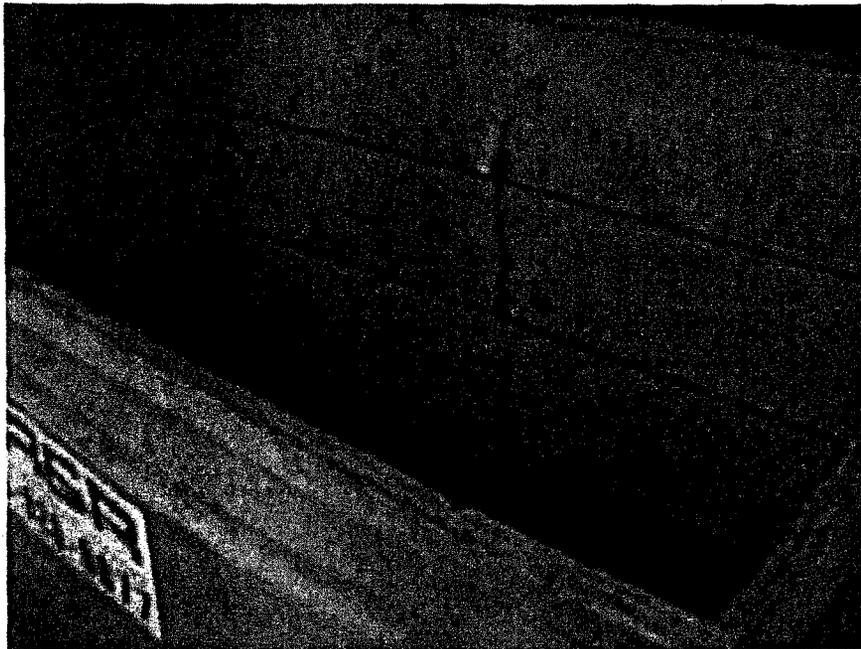
5. Utility owned vault transformer.



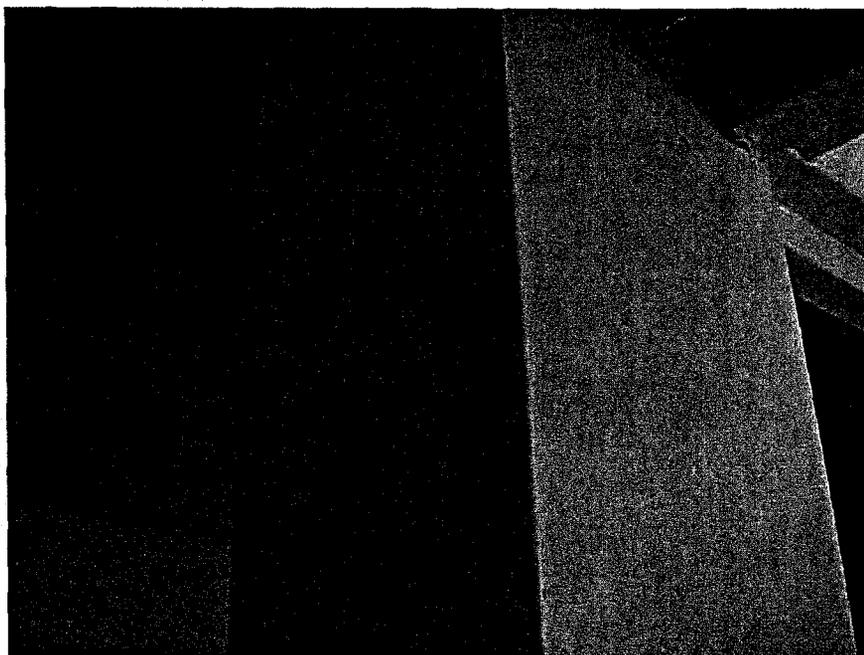
6. Maintenance chemical storage.



7. Pool chlorine in pool room.



8. Dumpster contents.

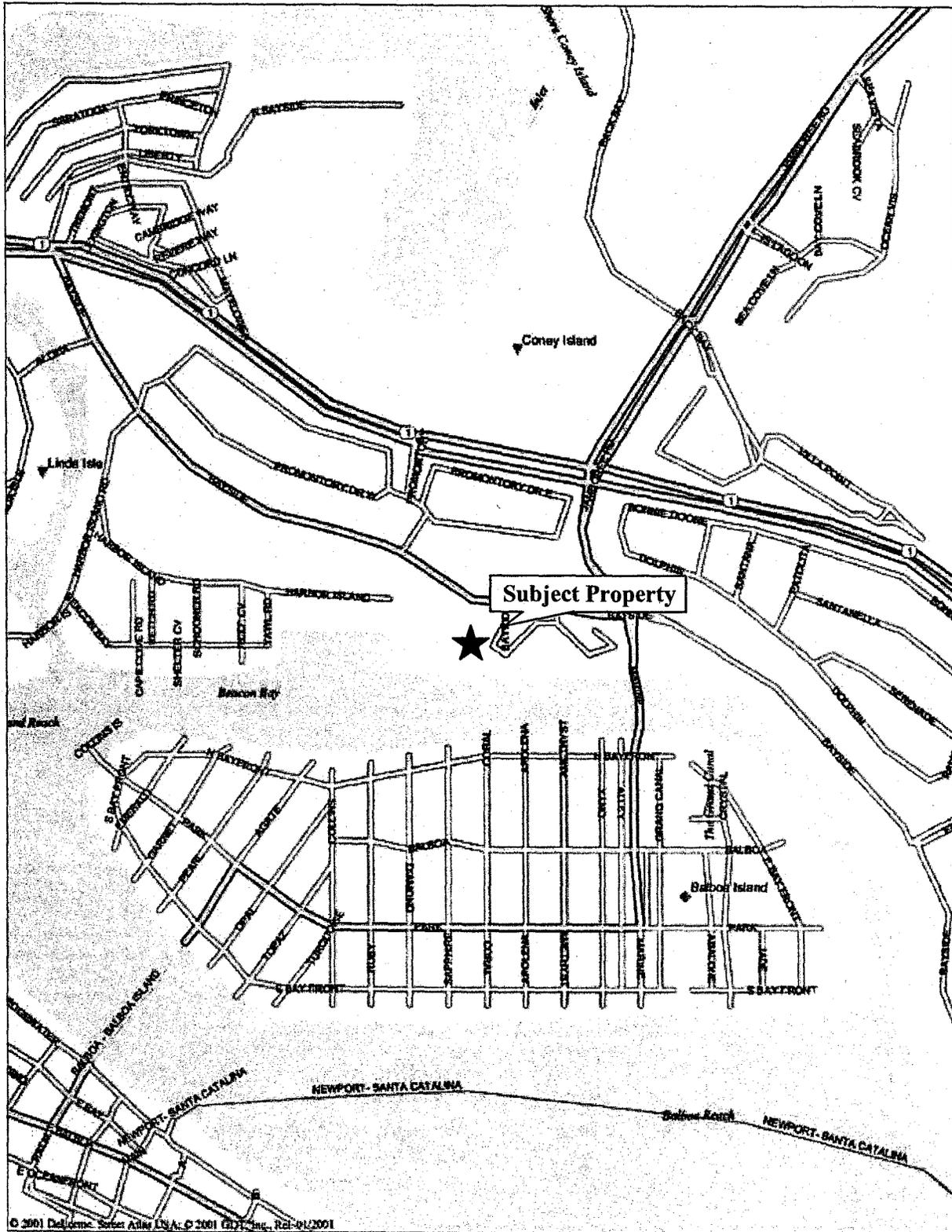


9. Lead based paint positive field test and sample location in unit.



10. Potential ACM in spray ceiling treatment.

APPENDIX B
FIGURES, DRAWINGS AND MAPS



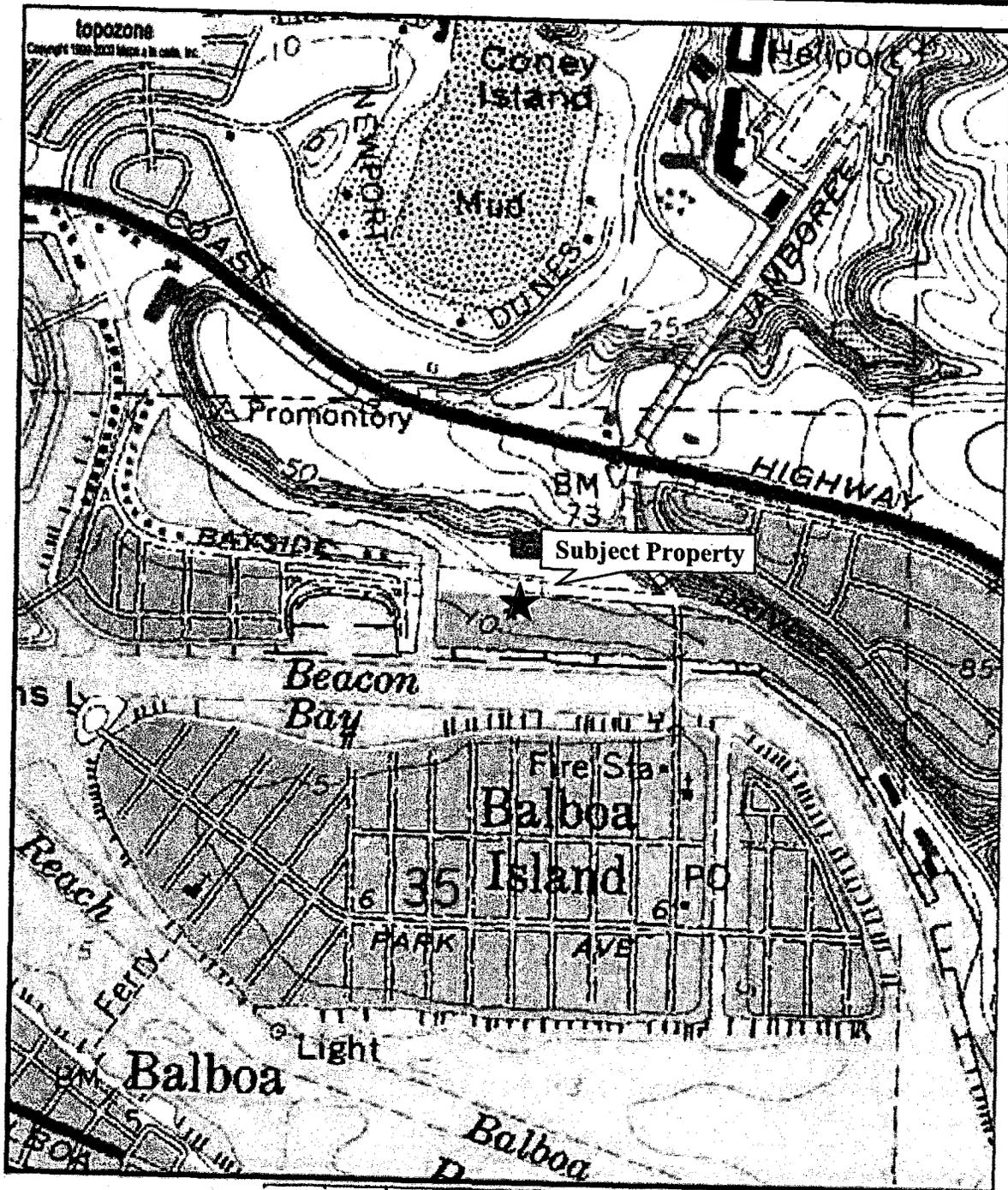
© 2001 Delorme, Street Atlas USA; © 2001 GDT, Inc., Rel-01/2001



NEWPORT MARINA APARTMENTS
 919 BAYSIDE DRIVE
 NEWPORT BEACH, CALIFORNIA 92660



Figure 1: Location Map



0 0.1 0.2 0.3 0.4 0.5 km
 0 0.1 0.2 0.3 0.4 0.5 mi
 Map center is 33° 36' 38"N, 117° 53' 34"W (WGS84/NAD83)
 NEWPORT BEACH quadrangle
 Projection is UTM Zone 11 NAD83 Datum

* M
 G
 M=13.383
 G=-0.494

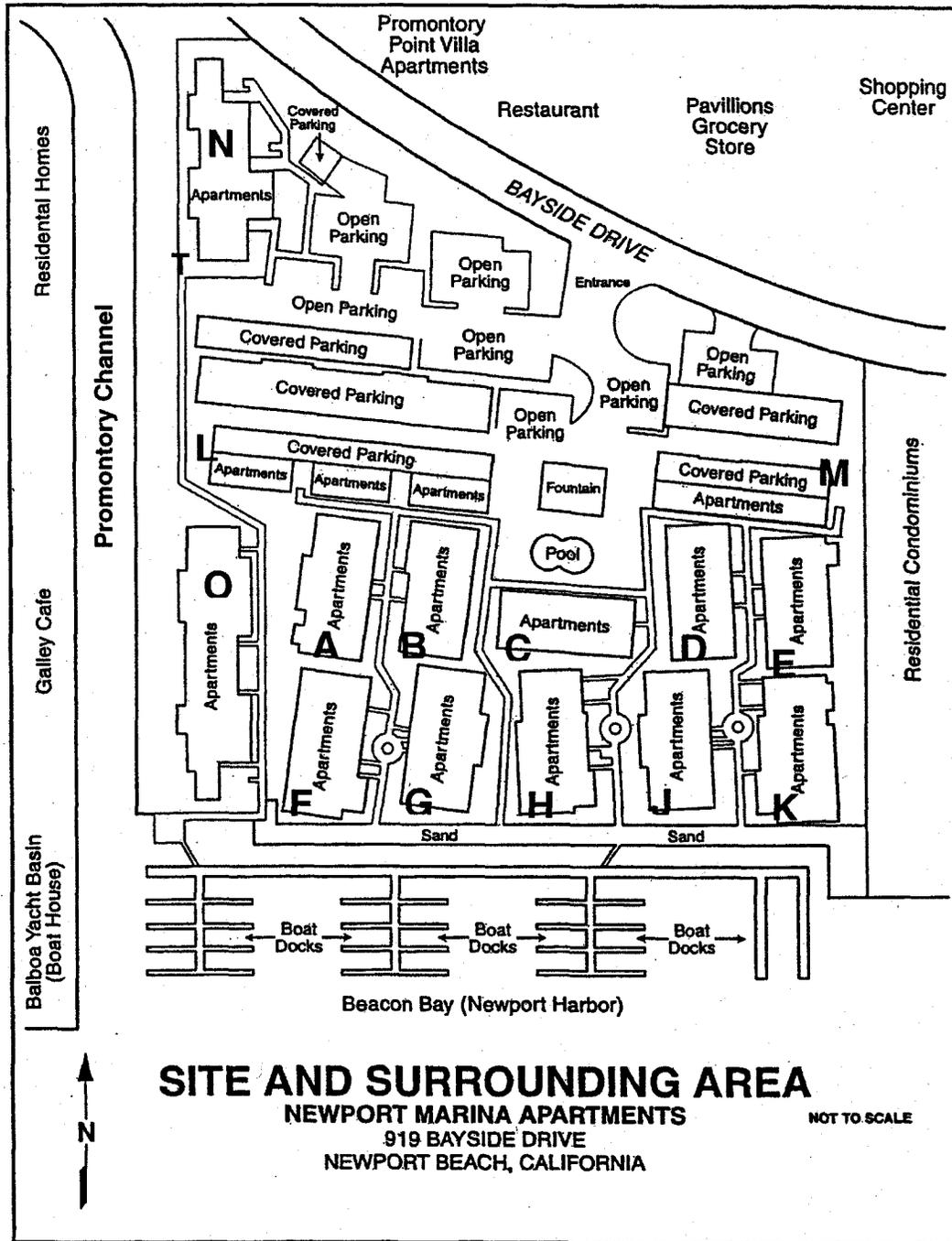


A portion of Newport Beach, CA GS 7.5x15 Minute
 Quadrangle Scale 1:24,000



Figure 2: Locus Map

NEWPORT MARINA APARTMENTS
919 BAYSIDE DRIVE
NEWPORT BEACH, CALIFORNIA 92660



Newport Marina Apts.
919 Bayside Drive
Newport Beach, CA



Figure 3: Site Plan

Legend: T-Pad Transformer

APPENDIX C
OTHER RELEVANT DOCUMENTS

PARCEL NO:05044205

TRA:07001

PROPERTY TYPE:2

BK_PG:05044

~~OWNER/MAILING ADDRESS~~

OWNER:IRVINE CO NEWPORT MARINA LLC
 CARE OF:WESTERN FINANCIAL GROUP
 VESTING:NO
 ADDRESS:P O BOX 19528
 CITY ST:IRVINE CA

(NUM) ZIP+4:92623

ALPHA ZIP+4:95288

~~SITUS ADDRESS/DESCRIPTION/ACRES~~

STREET:847 BAYSIDE DR #1
 CITY:NB NEWPORT BEACH

~~ASSESSED VAL EXEMPTIONS CODES DATES OTHER~~

LAND: 2312356 EXE AMT1; BASE L:1975 NO LVAL;
 IMPR: 2146415 EXE AMT2; BASE I:1977
 PP: DFLT DT:

OTHER:

GROSS: 4458771

NET: 4458771

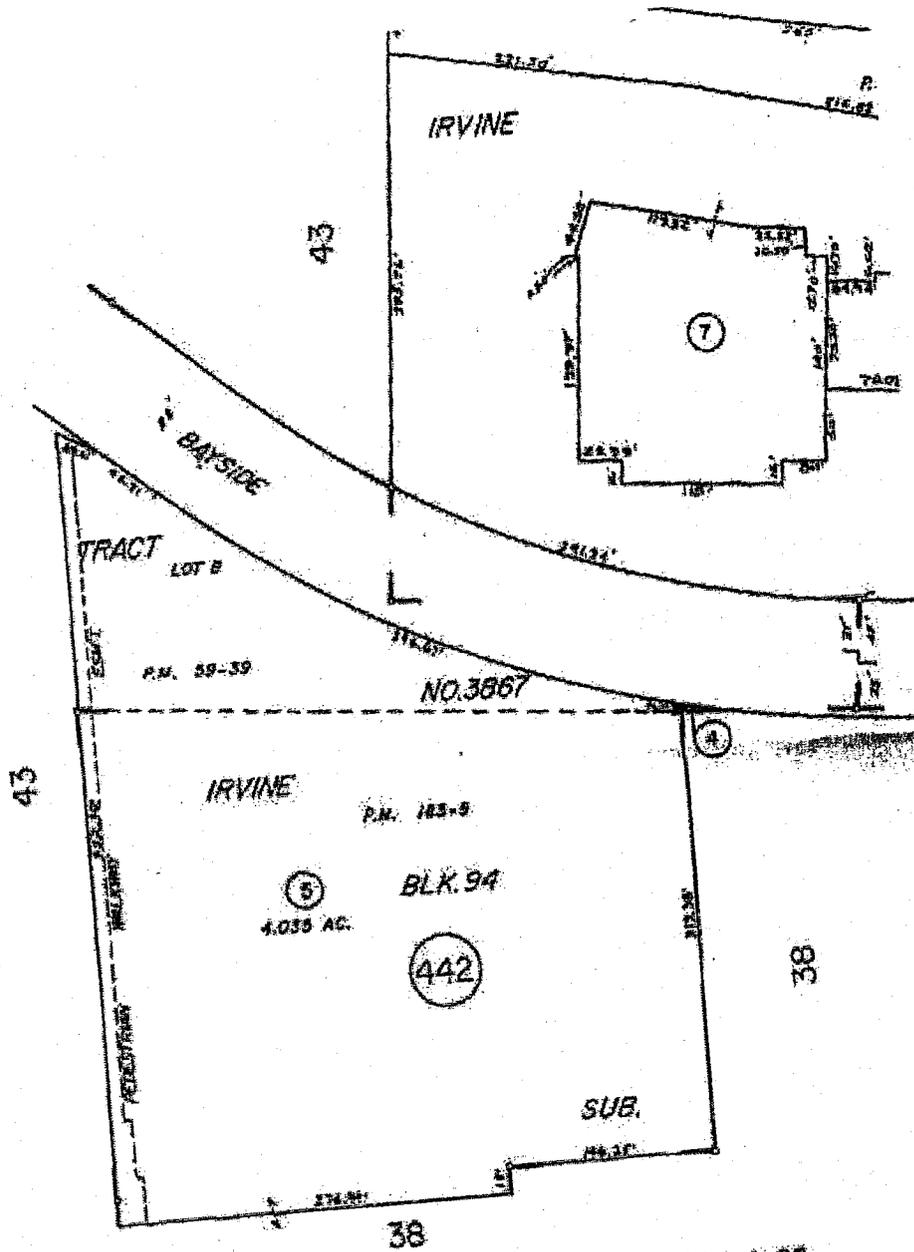
~~SALE HISTORY~~

REC NUM:R00442274

~~ADDITIONAL INFORMATION~~

ACRES:

LEGAL:PM. 185-09 PAR. 1 AND IRVINE SUB POR. OF BLK. 94.



MARCH 1973

IRVINE SUB
 TRACT NO. 3867
 PARCEL MAP
 PARCEL MAP

M.M. 1-88
 M.M. 301-40 TO 46 INC.
 P.M. 49-15
 P.M. 59-39, 185-9



WESTERN NATIONAL PROPERTY MANAGEMENT
A WESTERN NATIONAL GROUP COMPANY

Disclosure of Information on Lead-Based Paint and Lead-Based Paint Hazards

Apartment Community: Newport Marina Apartments

Lead Warning Statement:

Housing built before 1978 may contain lead-based paint. Lead from paint chips and dust can pose health hazards if not taken care of properly. Lead exposure is especially harmful to young children and pregnant women. Before renting pre-1978 housing, landlords must disclose the presence of known lead-based paint and lead-based paint hazards in the dwelling. Residents must also receive a Federally approved pamphlet on lead poisoning prevention.

Lessor's Disclosure (initial)

____ (a) Presence of lead-based paint or lead-based paint hazards (check one below):

Known lead-based paint and/or lead-based paint hazards are present in the dwelling (explain).

Lessor has no knowledge of lead-based paint and/or lead-based paint hazards in the dwelling.

____ (b) Records and reports available to the lessor (check one below):

Lessor has provided the lessee with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the dwelling (list documents below).

CTL Environmental Services
Report, dated 10/14/99.

Lessor has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the dwelling.

Lessee's Acknowledgment (initial)

____ (c) Lessee has received copies of all information listed above.

____ (d) Lessee has received the pamphlet *Protect Your Family from Lead in Your Home*.

Agent's Acknowledgment (initial)

____ (e) Agent has informed the lessor of the lessor's obligations under 42 U.S.C. 4582(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy

The following parties have reviewed the information above and certify, to the best of their knowledge, that the information provided by the signatory is true and accurate.

____ Lessor (Apartment Manager) Date

____ Lessee (Resident) Date

[Signature] 11/3/00
Agent (Management Company) Date



WESTERN NATIONAL PROPERTY MANAGEMENT
A WESTERN NATIONAL GROUP COMPANY

3700 Agnew Circle, Irvine, California 92614-7110
P.O. Box 19528, Irvine, California 92612-9528
(949) 862-6200 Fax (949) 862-6200

www.wnpg.com

November 1, 2000

Dear Newport Marina Apartments Resident:

As you may know, during the construction of many apartment communities, the mineral asbestos was commonly used for insulation, fireproofing and other purposes. As you may be aware, inhaling asbestos fibers can cause or contribute to many serious diseases. Under The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), asbestos has been listed as a chemical known to the state to cause cancer. However, the presence of asbestos in a building does not necessarily mean residents are being exposed to asbestos fibers in a way that presents a significant risk (under Proposition 65, or otherwise) and, we have no reason to believe residents in your apartment community are being exposed to any health risk from asbestos.

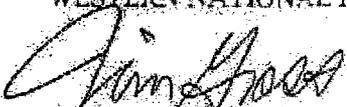
As part of our effort to provide you with a safe living environment, we retained an expert independent asbestos consultant to perform various inspections of our apartment communities. These inspections have been completed and our independent consultant has advised us asbestos is present in *Linoleum (bottom layer - off white square pattern in bedrooms), Acoustic Ceiling Texture, Air Cell Attic Insulation, Transit Water Heater Exhaust Pipe, and Stucco*. Any risks posed by this asbestos can be virtually eliminated if simple precautions are taken. On the reverse side of this notification, we have provided a list of such common sense precautions for your general information and to guide your living activities for the future. Full compliance with these precautions will virtually assure the asbestos containing materials are maintained in a safe and stable condition.

Finally, Proposition 65 requires that persons be warned of certain exposures to chemicals listed under Proposition 65. We have no reason to believe a health risk from asbestos is present in your apartment community.

If you have any questions concerning this letter, please contact me at (949) 862-6251.

Very truly yours,

WESTERN NATIONAL PROPERTY MANAGEMENT, INC.


Jim Gross, IBFA, MPFA
Asbestos Coordinator

JG:qc

I hereby acknowledge I have received a copy of this Proposition 65 notification.

(Resident Signature)

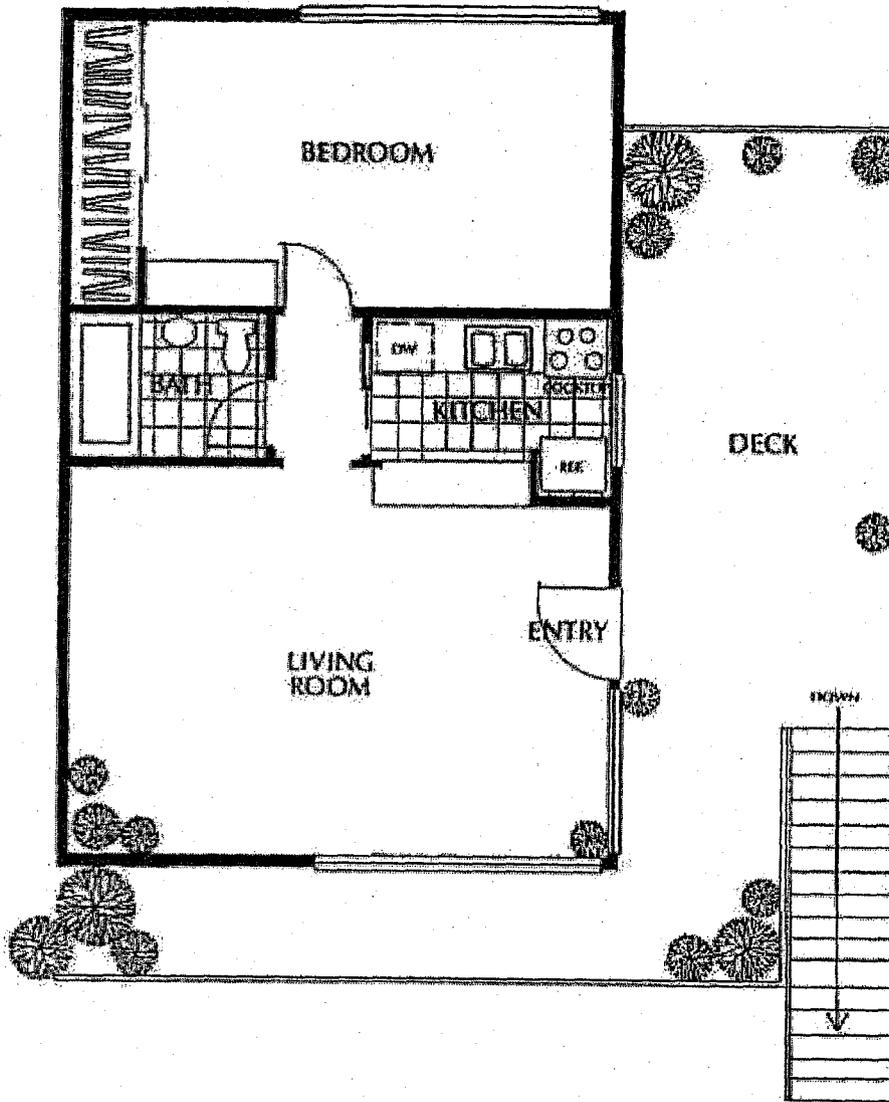
(Date)

(Apt #)



THE NEWPORT MARINA APARTMENTS

PLAN 1
650 Square Feet



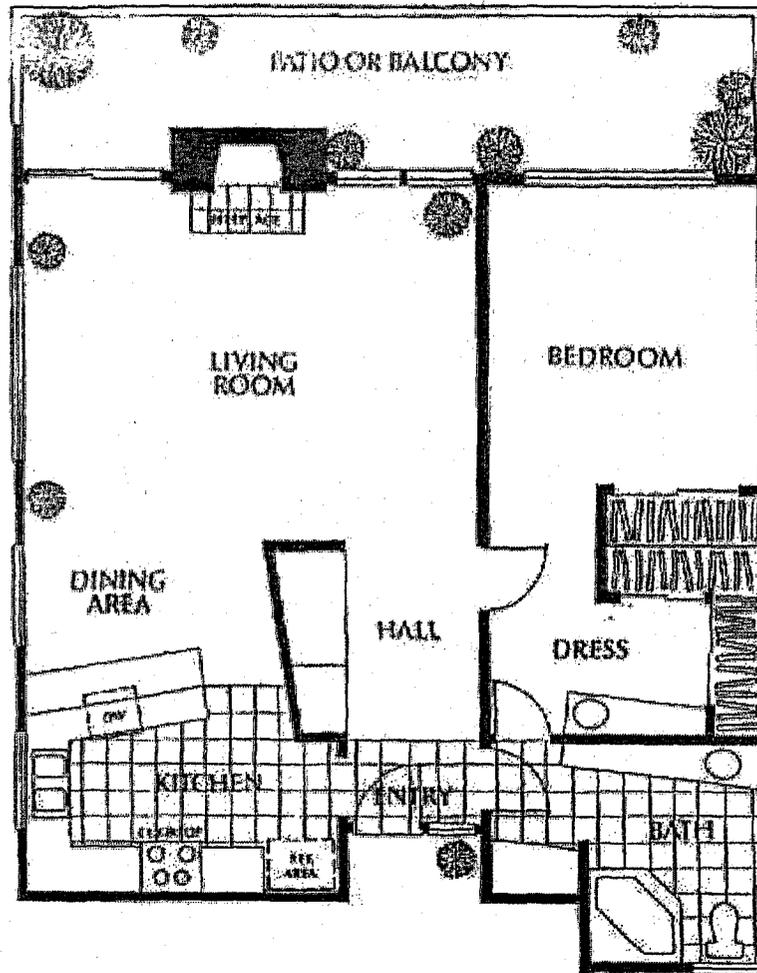
One Bedroom, One Bath, Living Room, Private Deck, Kitchen with Dishwasher, Microwave and Refrigerator

All square footages are approximate. Consult a rental representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 2

1,100 Square Feet

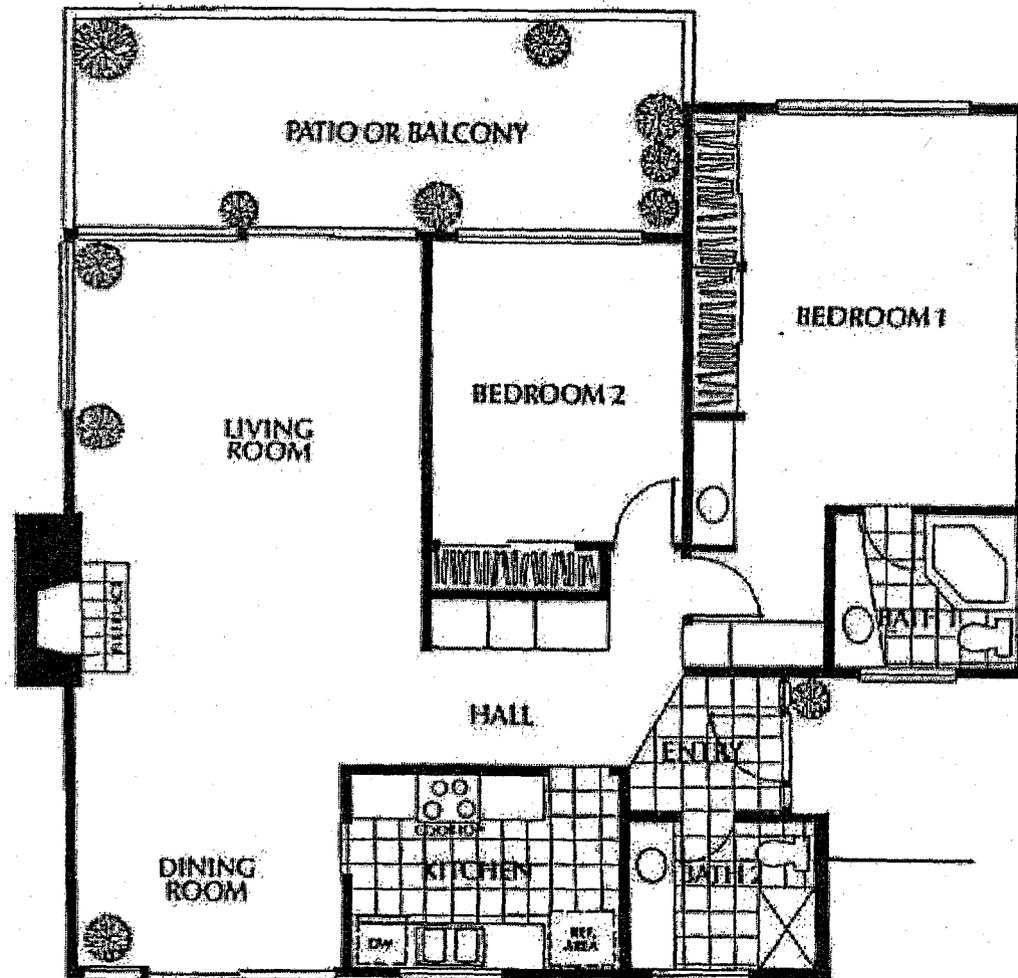


One Bedroom, One Bath, Living Room with Wood-Burning Fireplace, Dining Room, Kitchen with Dishwasher and Microwave, Dressing Room, Private Patio or Balcony

All square footages are approximate. Consult a general representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 3 1,220 Square Feet

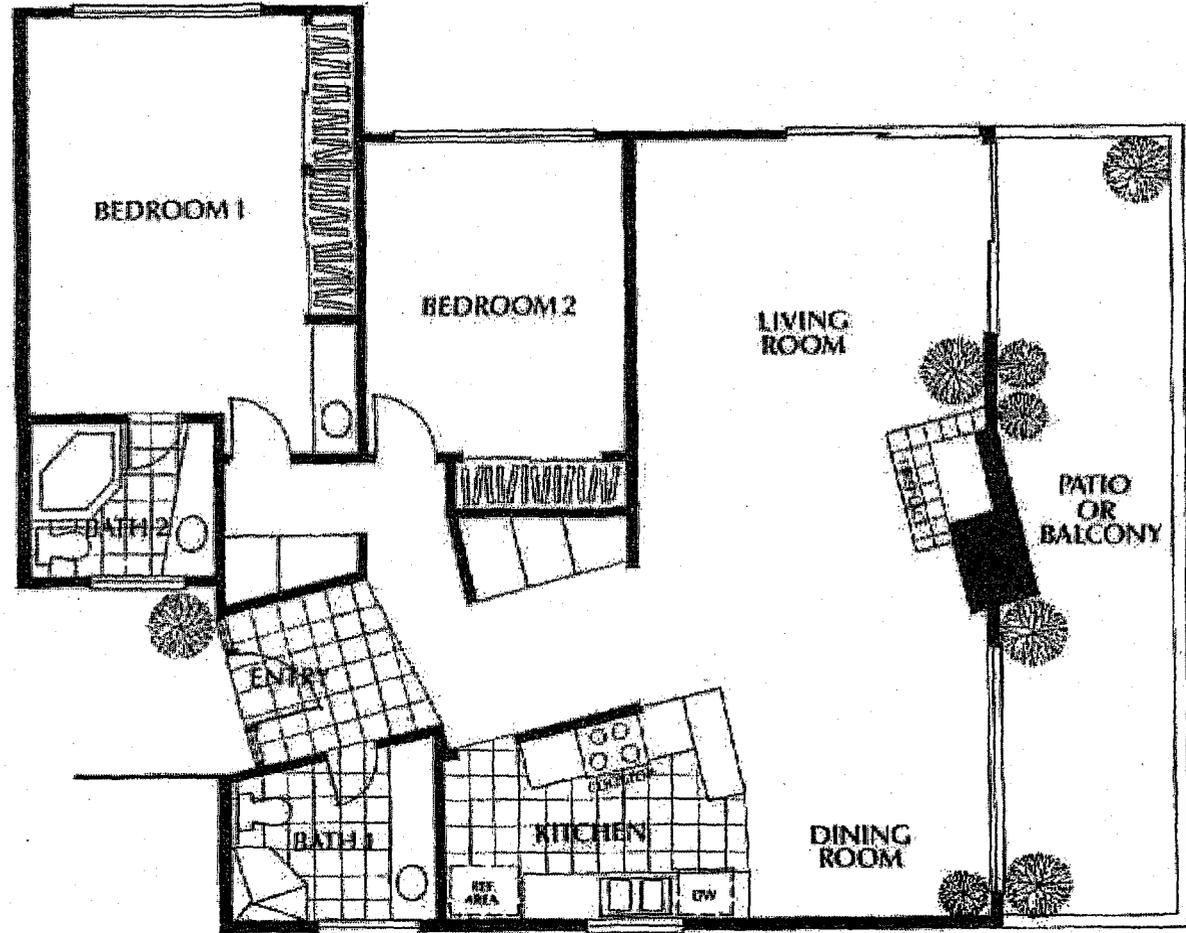


Two Bedrooms, Two Baths, Living Room with Wood-Burning Fireplace, Dining Room, Kitchen with Microwave and Dishwasher, Private Patio or Balcony

All square footages are approximate. Consult a rental representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 4
1,450 Square Feet

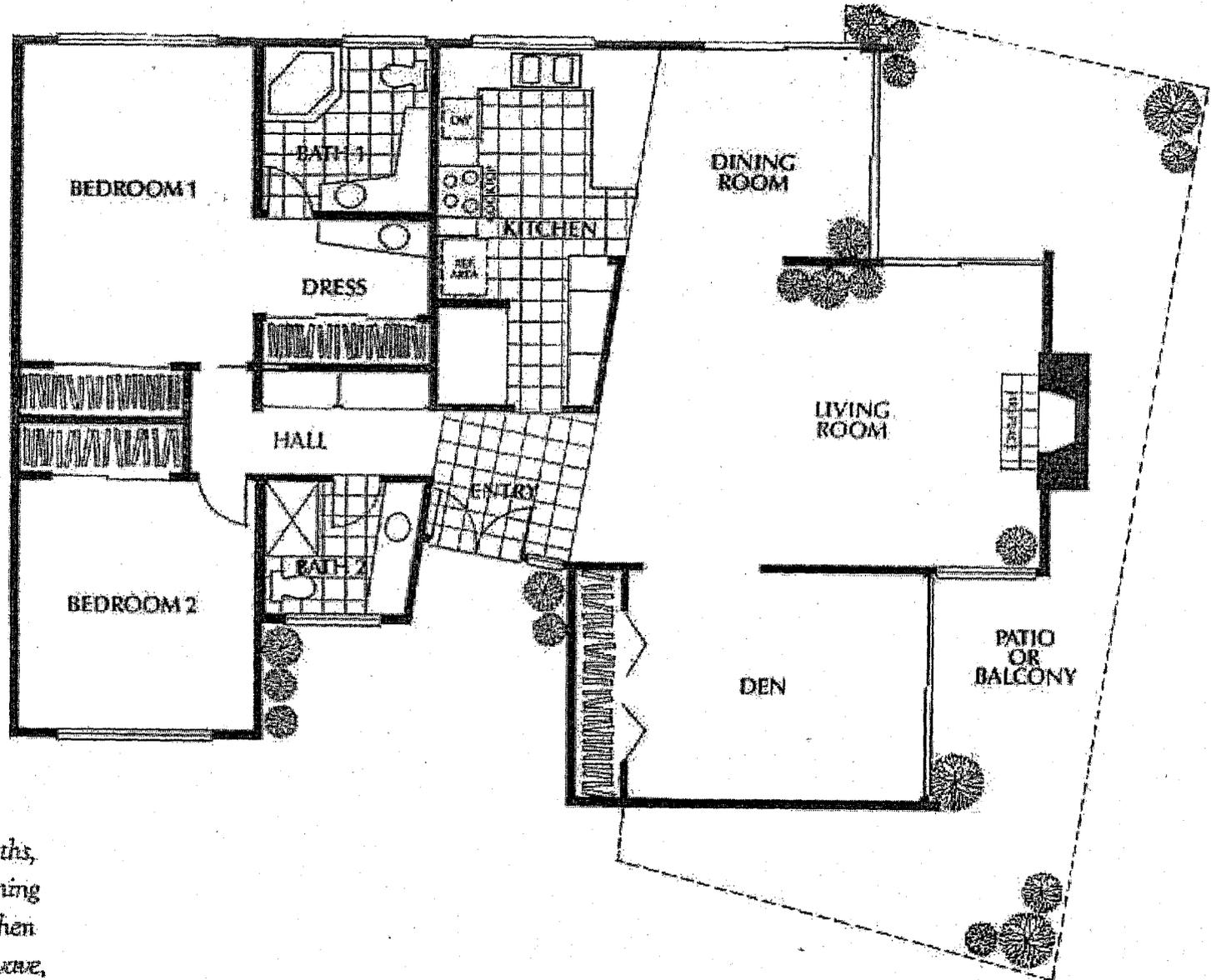


Two Bedrooms, Two Baths, Living Room with Wood-Burning Fireplace, Dining Room, Kitchen with Microwave and Dishwasher, Private Patio or Balcony

All square footages are approximate. Consult a rental representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 5
1,800 Square Feet

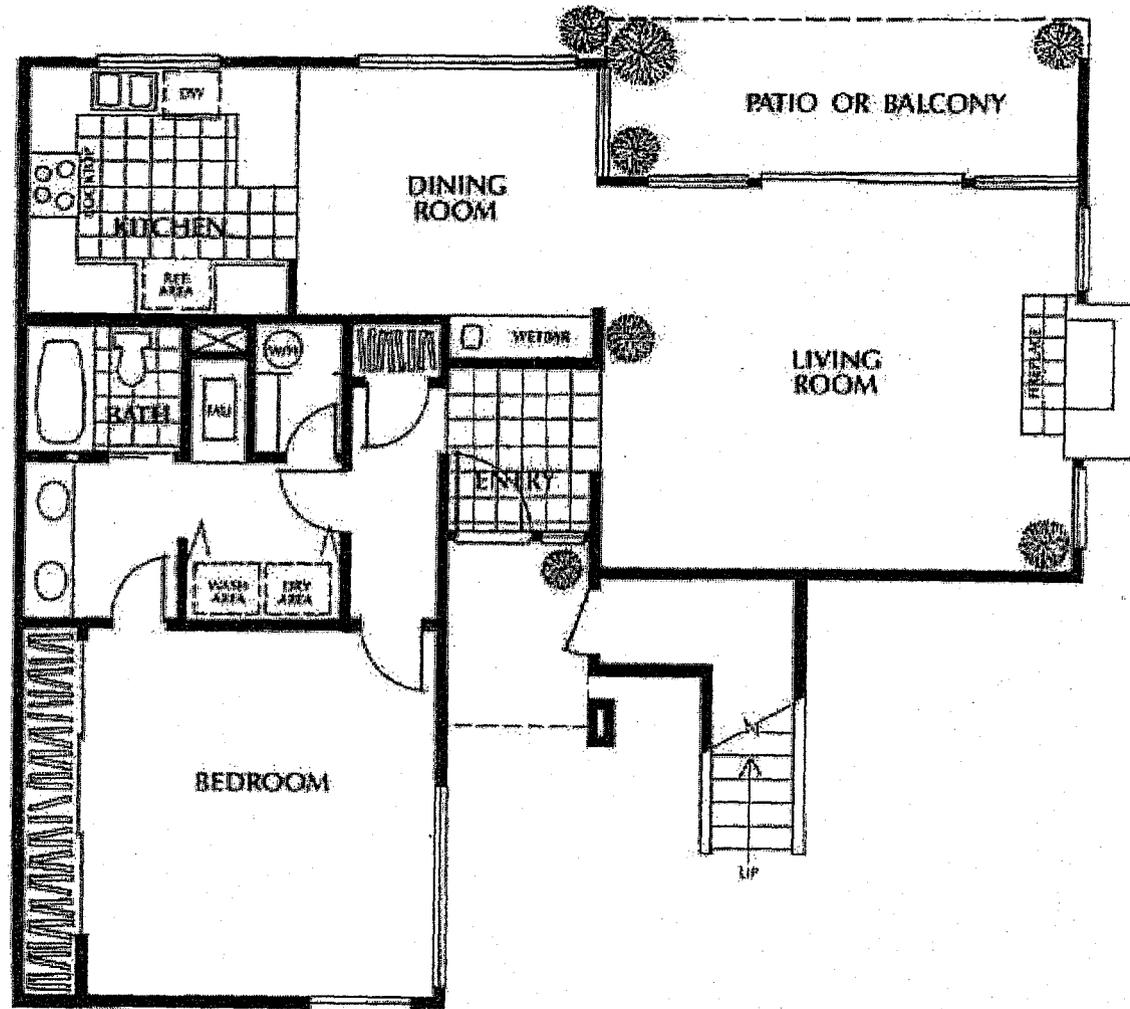


*Two Bedrooms, Den, Two Baths,
Living Room with Wood-Burning
Fireplace, Dining Room, Kitchen
with Dishwasher and Microwave,
Dressing Room, Private Patio or
Balcony*

All square footages are approximate. Consult a rental representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 6 1,100 Square Feet

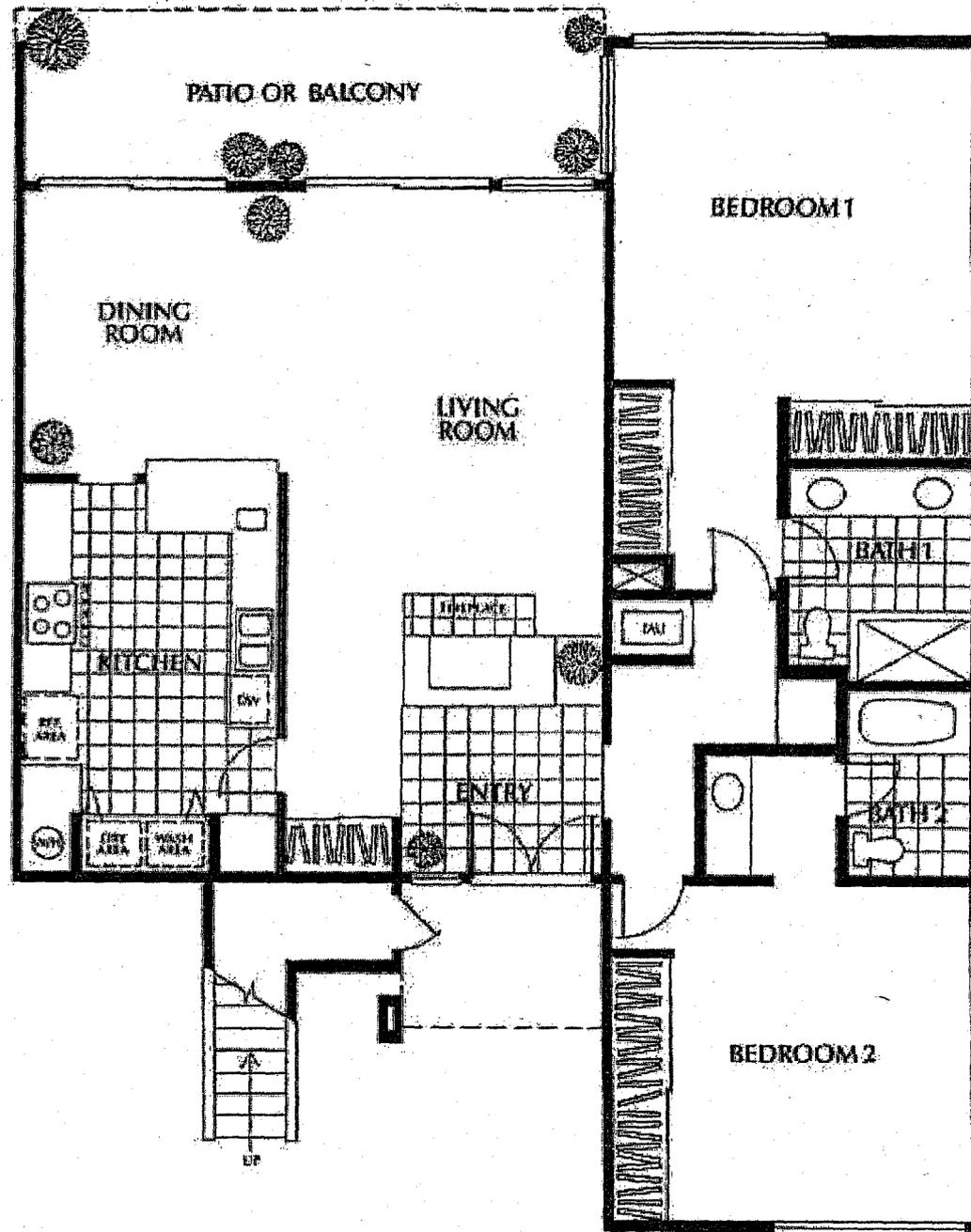


One Bedroom, One Bathroom with Dual Sink Vanity, Living Room with Wood-Burning Fireplace, Dining Room with Wet Bar, Kitchen with Dishwasher and Microwave, Washer and Dryer Area, Private Patio or Balcony

All square footages are approximate. Consult a rental representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 7
1,560 Square Feet

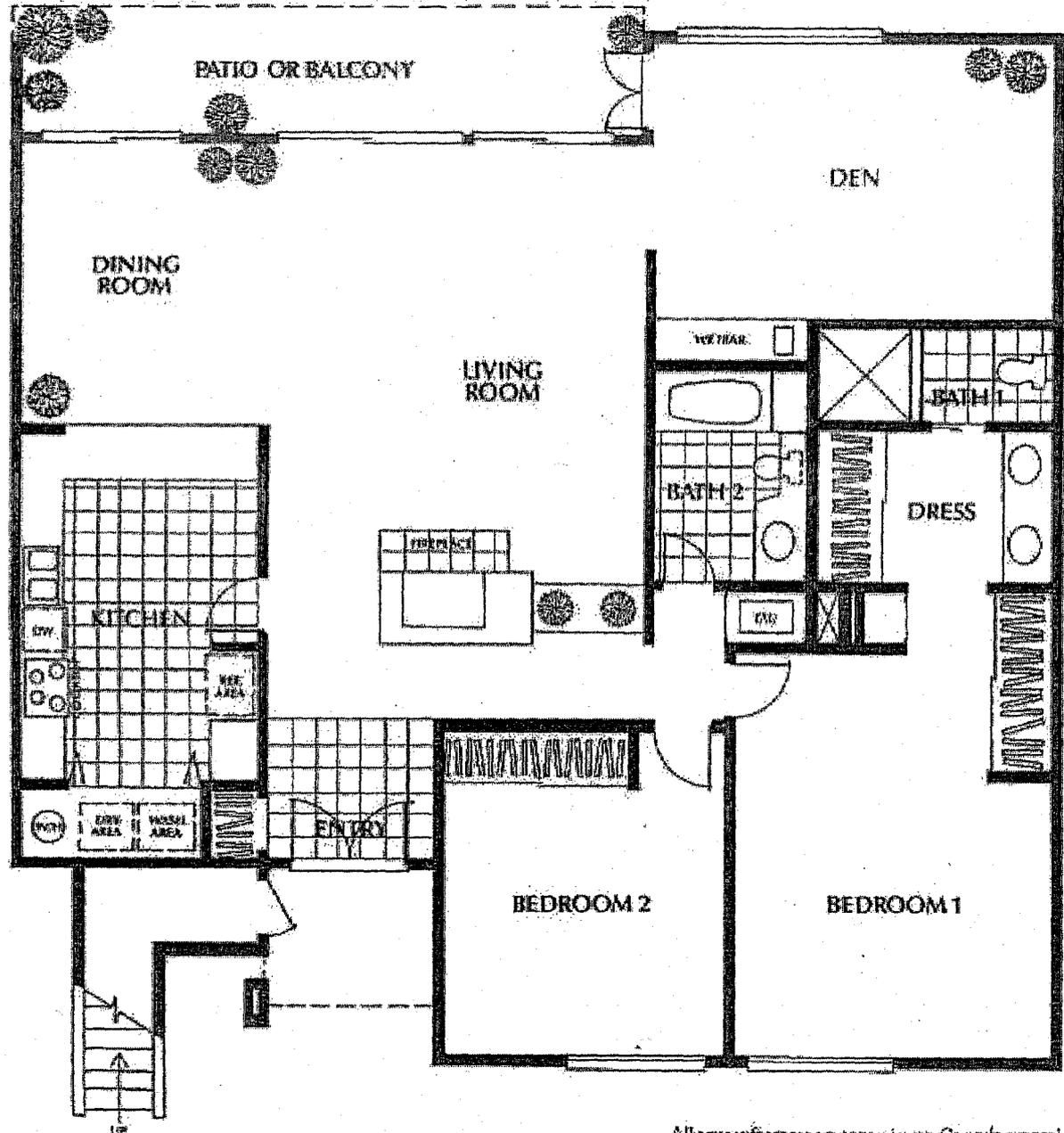


Two Bedrooms, Two Bathrooms,
Living Room with Wood-Burning
Fireplace, Dining Room, Kitchen
with Dishwasher and Microwave,
Washer and Dryer Area, Private
Patio or Balcony

All square footages are approximate. Consult a rental representative for specifics.

THE NEWPORT MARINA APARTMENTS

PLAN 8
1,800 Square Feet



Two Bedrooms, Den with Wet Bar,
Two Baths, Living Room with
Wood-Burning Fireplace, Dining
Room, Kitchen with Dishwasher
and Microwave, Washer and Dryer
Area, Dressing Room with Dual
Sink Vanity, Private Patio or Balcony

All square footages are approximate. Consult a rental representative for specifics.

Newport Marina (2667)

As of 09/24/2003

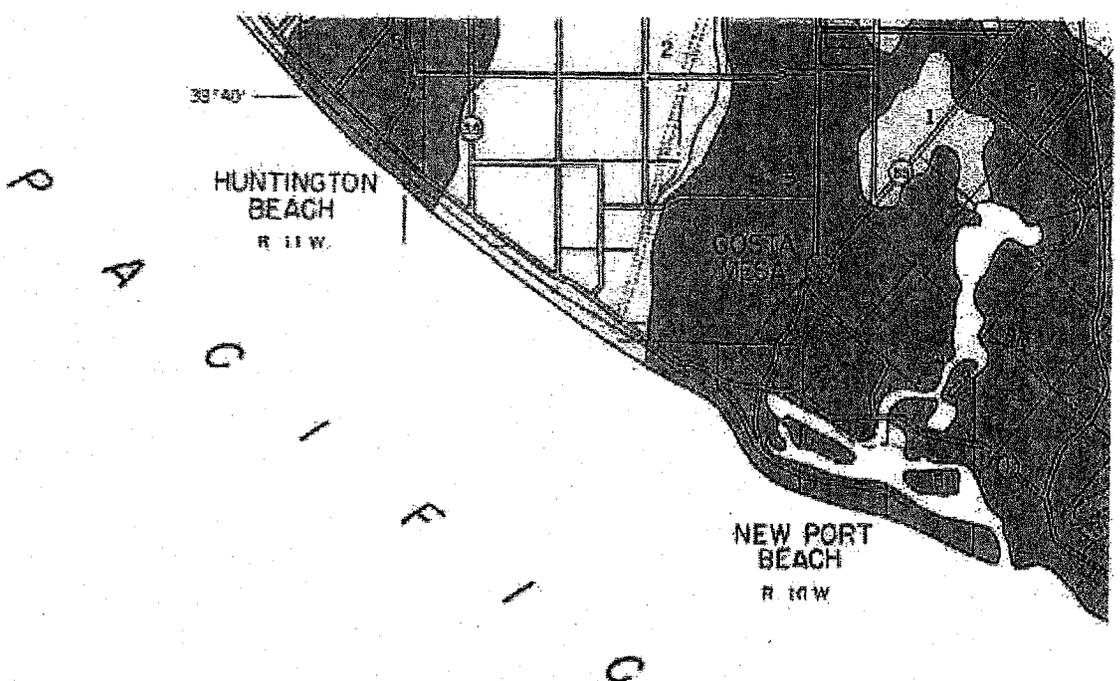
Unit #	Unit Type	Resident Code	Name	Square Feet	Market Rent	Lease Rent	Deposit	Move In	Lease Exp	NSF	Late	Status
A1	22AL	s22	JOHN BEED	1,442	2,550	2,500	1,090	4/16/02	6/30/03	0	0	OC
A2	22AM	s24	JACK COUGHLAN	1,330	2,350	2,300	1,090	11/21/01	3/31/04	0	0	OC
A3	22BL	s29	JANE PFAU	1,442	2,650	2,500	1,090	5/28/03	6/30/04	0	0	OC
A4	22BM	s212	LISA TUCKER	1,330	2,350	2,300	1,090	6/26/01	5/31/04	0	0	OC
B1	22AI	s215	STEVEN KERPER	1,245	2,350	2,350	1,090	9/6/03	5/31/04	0	0	OC
B2	22AX	s220	SKYLINE REALTY	1,217	2,400	2,350	1,090	12/20/02	6/30/04	0	2	OC
B3	22BI	s221	BEN CLERX	1,245	2,350	2,300	2,790	1/22/05	12/31/01	0	0	OC
B4	22BX	s224	GREG KEEVER	1,217	2,400	2,350	1,090	10/21/01	6/30/03	0	0	OC
C1	22AI	s225	ROGER & HELEN BENNETT	1,245	2,550	2,350	2,700	6/28/99	3/31/04	0	0	OC
C2	22AX	s229	WILLIAM J. HYDE	1,217	2,400	2,350	1,090	11/30/02	6/31/04	0	0	OC
C3	22BI	s234	DON SLOPER	1,245	2,550	2,500	1,090	7/1/02	3/31/04	0	0	OC
C4	22BX	s235	CHRISTIAN MAC DONALD	1,217	2,400	2,260	1,340	12/14/99	5/31/04	0	0	OC
D1	22AX	s236	GEORGE MICKAELIAN	1,217	2,400	2,150	2,500	1/1/00	3/31/04	0	0	OC
D2	22AI	s237	MARIANNE COBERLY	1,245	2,350	2,110	2,450	3/25/08	4/30/04	0	0	OC
D3	22BX	s239	GIL MAY	1,217	2,400	2,350	1,090	2/1/03	1/31/04	0	0	OC
D4	22BI	s240	CARDL SCOTT	1,245	2,350	2,050	2,400	6/1/91	4/30/04	0	0	OC
E1	22AI	s245	TERRY STILLSON	1,245	2,350	2,300	1,590	5/15/03	4/30/04	0	0	OC
E2	22AX	s247	MANAGER	1,217	2,350	2,300	0	2/9/01		0	0	OC
E3	22BI	s250	DIANE WALLACE	1,245	2,350	2,350	1,090	9/1/03	5/31/04	0	0	OC
E4	22BX	s255	ROSEANNE LEVAN	1,217	2,350	2,350	1,090	9/20/03	3/31/04	0	0	OC
F1	22AW	s258	PATRICK AND DOROTHY HURLEY	1,785	3,750	3,575	1,090	8/23/02	8/31/04	0	0	OC
F2	11AX	s260	TAREK SAMEE	1,078	2,050	1,800	1,090	2/15/02	4/30/04	0	0	OC
F3	22BW	s265	KJELL DAHL	1,785	4,000	3,800	1,090	6/21/03	6/30/04	0	1	OC
F4	11BX	s270	STEVEN D. TOPEL	1,078	2,050	2,000	1,090	10/2/01	5/31/04	0	0	OC
G1	22AM	s271	BARBARA BEDALL	1,330	2,550	2,250	2,590	8/1/89	4/30/04	0	0	OC
G2	22AL	s274	JIM & LOUISE LESNIAK	1,442	2,950	3,100	1,090	9/22/03	9/30/04	0	0	OC
G3	22BM	s275	THOMAS ANDERSON	1,330	2,550	2,335	2,675	12/1/98	4/30/04	0	1	OC
G4	22BL	s278	VICTOR J. MICHAEL	1,442	2,950	3,125	1,090	6/28/03	6/30/04	0	0	OC
H1	22AW	s279	PATRICIA BARNES	1,785	3,750	3,750	4,210	11/19/99	8/31/04	0	0	OC
H2	11AX	s280	BEVERLY ENGSTROM	1,078	2,050	1,900	2,240	2/5/99	5/31/04	0	0	OC
H3	22BW	s283	CINDI ZELLNER	1,785	3,750	3,575	1,090	10/1/02	3/31/04	0	0	OC
H4	11BX	s286	AARON J. (A.J) LOFT	1,078	2,050	2,000	0	4/26/03	4/30/04	0	1	NU
J1	22AL	s289	THOMAS TARBUTTON	1,442	2,950	3,100	1,090	8/29/01	6/30/03	0	0	OC
J2	22AM	s290	GERALD LEVINE	1,330	2,550	2,320	3,190	3/16/99	4/30/04	0	0	OC
J3	22BL	s291	RONALD ANDERSON	1,442	2,950	2,900	1,090	2/22/97	4/30/04	0	0	OC
J4	22BM	s295	MELISSA & BRENT KUHN	1,330	2,550	2,500	1,090	6/28/03	8/30/04	0	0	OC
K1	11AX	s2104	CAROLINE MESKER	1,078	2,050	2,000	1,590	3/5/03	2/29/04	0	0	OC
K2	22AW	s2107	BJD HEFLER	1,785	3,750	3,700	1,090	6/21/03	6/30/04	0	0	OC
K3	11BX	s2112	JEFF GRAASS	1,078	2,050	2,025	1,090	7/31/03	4/30/04	0	0	OC
K4	22BW	s2114	MARC CROSS	1,785	3,750	3,575	1,090	1/25/01	5/31/04	0	0	OC
L1	11BV	s2118	ALBERT NAVARRA	621	1,450	1,325	1,090	7/5/03	7/8/04	0	0	OC
L2	11BG	s2124	JAMES G. ALDEN	621	1,450	1,345	590	4/4/02	6/30/04	0	0	OC
L3	11BG	s2126	KAREN WILLIAMSON	621	1,450	1,400	1,090	12/8/02	6/30/03	0	0	OC
L4	11BG	s2133	CHRISTY CORTES	621	1,450	1,425	590	9/5/02	8/31/04	0	0	OC
L5	11BG	s2134	SALLY BAILEY	621	1,450	1,290	1,630	2/1/96	5/31/04	0	0	OC
L6	11BG	s2135	KRISTINE GABRIEL	621	1,400	1,280	1,575	11/9/99	6/30/04	0	0	OC
M1	11BG	s2138	JASON FRITTON	621	1,400	1,400	2,800	9/8/03	5/31/04	1	1	OC
M2	11BG	s2139	SOPHIA HORTON	621	1,450	1,290	1,090	4/24/98	3/31/03	0	0	OC
M3	11BG	s2146	INC AIRCLAIMS	621	1,450	1,400	1,090	2/20/03	2/29/04	0	0	OC

Newport Marina (2667)

As of 09/24/2003

Unit #	Unit Type	Resident Code	Name	Square Feet	Market Rent	Lease Rent	Deposit	Move In	Lease Exp	NSF	Late	Status
M4	11BG	s2150	ANNIE BALJI-DEMIRCIAN	821	1,450	1,425	2,850	8/5/03	7/31/04	0	0	OC
N1	11AW	s2151	KENNETH HALL	1,109	2,150	1,945	2,285	1/18/89	5/31/04	0	0	OC
N2	11BW	s2153	RICHARD SIRÖONIAN	1,109	2,150	2,100	4,200	8/5/02	8/31/02	0	1	OC
N3	22AC	s2154	JAMES SCOTT DAVID	1,553	3,200	2,795	1,090	5/7/00	4/30/04	0	0	OC
N4	22BC	s2156	DIANA BROWN	1,553	3,200	2,800	1,150	2/2/02	4/30/04	0	0	OC
N5	22AC	s2157	JEAN WRIGHT	1,553	3,200	2,800	2,940	7/1/85	5/31/04	0	0	OC
N6	22BC	s2160	JANICE LAWSON	1,553	3,200	2,750	500	2/1/02	4/30/04	0	0	OC
O1	22AD	VACANT	VACANT	1,723	3,150	3,150	0					VR
O2	22BD	s2169	CHRISTIAN GRO & NORA DAHL	1,723	3,150	2,900	500	1/15/02	4/30/04	0	1	OC
O3	22AD	s2172	MORRIS A. PIVAROFF	1,723	3,150	2,800	1,090	12/11/02	5/31/04	0	0	OC
O4	22BD	s2173	KARY BANKS MULLIS	1,723	3,150	3,010	3,350	3/18/98	5/31/04	0	0	OC
O5	22AD	s2176	BART BEAN	1,723	3,150	2,800	800	1/10/02	4/30/04	0	0	OC
O6	22BD	s2177	ARCH KIRKWOOD	1,723	3,150	3,010	3,350	12/20/98	4/30/04	0	0	OC
O7	11AW	s2180	JAMES E. DEANS	1,109	2,550	2,500	1,090	12/23/02	6/30/04	0	0	OC
O8	11BW	s2181	CHARLES & MARILYN HEERS	1,109	2,550	2,475	2,815	5/15/04	5/31/04	0	0	OC
TOTALS				80,702	161,150	153,425	98,770					

Code	Status Description	# Units		Rent Schedule	Amount
OC	Occupied, No Notice	62	98.85 %	Units Occupied - Actual Rents	150,275
NU	Occupied, Notice, Unrented	1	1.58 %	Units Vacant - Vacant Potential	3,150
NR	Occupied, Notice, Rented	0	0.00 %	100% Gross Potential Value	153,425
VU	Vacant, Unrented	0	0.00 %		
VR	Vacant, Rented	1	1.58 %	Total Deposits	98,770
EV	Eviction	0	0.00 %	Total Rentable Square Feet	80,702
Total Units		64			



SOIL ASSOCIATIONS*

SOMEWHAT EXCESSIVELY DRAINED TO POORLY DRAINED, NEARLY LEVEL TO MODERATELY SLOPING SOILS ON ALLUVIAL FANS AND FLOOD PLAINS AND IN BASINS OF THE COASTAL PLAINS

- 1. Ohino-Omi association: Nearly level, somewhat poorly drained and poorly drained, calcareous silt loams to clays on alluvial fans and flood plains and in basins.
- 2. Hueneme-Boise association: Nearly level, poorly drained and somewhat poorly drained, calcareous fine sandy loams, silt loams, and silty clay loams on alluvial fans and flood plains.
- 3. Metz-San Emigdio association: Nearly level, somewhat excessively drained and well drained, calcareous loamy sands and fine sandy loams on alluvial fans and flood plains.
- 4. Sorrento-Mocho association: Nearly level to moderately sloping, well drained sandy loams, loams, or clay loams on alluvial fans and flood plains.

MODERATELY WELL DRAINED, NEARLY LEVEL TO MODERATELY STEEP SOILS OF THE COASTAL TERRACES

- 5. Myford association: Nearly level to moderately steep, moderately well drained sandy loams that have a strongly developed subsoil; on terraces.

SOMEWHAT EXCESSIVELY DRAINED AND WELL DRAINED, STRONGLY SLOPING TO VERY STEEP SOILS OF THE COASTAL FOOTHILLS

- 6. Ato-Bosanko association: Strongly sloping to steep, well drained clays on coastal foothills.
- 7. Cienega-Anaheim-Soper association: Strongly sloping to very steep, somewhat excessively drained and well drained sandy loams, loams, clay loams, gravelly loams, and cobbly loams on coastal foothills.

SOMEWHAT EXCESSIVELY DRAINED AND WELL DRAINED, STRONGLY SLOPING TO VERY STEEP SOILS OF THE SANTA ANA MOUNTAINS

- 8. Filant-Cienega-Exchequer association: Strongly sloping to very steep, somewhat excessively drained and well drained fine sandy loams, sandy loams, and gravelly silt loams on mountains.

WELL DRAINED, GENTLY SLOPING TO STRONGLY SLOPING SOILS ON TERRACES AND ALLUVIAL FANS IN THE SANTA ANA MOUNTAINS

- 9. Ramona-Hanford association: Gently sloping to strongly sloping, well drained fine sandy loams, gravelly fine sandy loams, and sandy loams on terraces and alluvial fans.

*Textures in names of associations refer to the surface layer of the major soils.

Compiled 1977

Each area outlined on this map consists of one or more soil types. The map is then...

R 10 W.

(Zone about 9)

1 500 000 FEET

117° 52' 30"

33° 37' 30"



530 000
FEET

(Zone about 14, upper left)

T 68
T 75

33° 35'

117° 52' 30"

115
Newport

Park
Beach

Balboa
Island

Balboa
Beach

215

55

5. Myford association

Nearly level to moderately steep, moderately well drained sandy loams that have a strongly developed subsoil on terraces

This association is mainly along the coastline up to 5 miles inland and along lower edges of the foothills. The soils formed in sandy sediments mostly on marine terraces. They are also on older alluvial fans and terrace remnants in the foothills. Slopes are 0 to 30 percent. The plant cover generally is annual grasses and forbs and in some areas scattered brush. Elevation ranges from 50 to 1,500 feet. The average annual rainfall is 12 to 20 inches and the average annual air temperature is about 62° F. The frost-free season is 270 to 350 days.

This association occupies 10 percent of the survey area. It is about 80 percent Myford soils and 20 percent Capistrano, Chesterton, Marina, and Yorba soils.

Myford soils are moderately well drained. The surface layer is pale brown and pinkish gray sandy loam. The subsoil is brown and light brown sandy clay and sandy clay loam. The substratum is very pale brown sandy loam to a depth of more than 60 inches.

These soils are used mostly for pasture, range, and urban development.

Somewhat Excessively Drained and Well Drained, Strongly Sloping to Very Steep Soils of the Coastal Foothills

The two soil associations in this group make up about 25 percent of the survey area. They are in sedimentary deposits of the coastal foothills.

Elevation ranges from 100 to 4,000 feet. The average annual rainfall is 12 to 25 inches, and the average annual air temperature is 59 to 62° F. The frost-free season is 200 to 350 days.

These associations are used mainly for pasture and range. The better sites are in barley or irrigated citrus. Some areas are used for urban development.

6. Alo-Bosanko association

Strongly sloping to steep, well drained clays on coastal foothills

This association is northeast of the coastal terraces in the San Clemente to Corona Del Mar areas to the Santa Ana Mountains; northeast of the flood plains and terraces of the El Toro to the Orange cities area; and north of flood plains and terraces in the Anaheim to Buena Park areas to the Los Angeles and San Bernardino County lines. The soils formed in material weathered from calcareous sandstone and shale. Slopes are 9 to 50 percent. The plant cover consists of annual grasses, mustard, and other forbs. Elevation ranges from 200 to 2,500 feet. The average annual rainfall is 12 to 20 inches, and the average annual air temperature is 59 to 62° F. The frost-free season is 300 to 350 days.

This association occupies 10 percent of the survey area. It is about 55 percent Alo soils; 25 percent Bosanko soils; and 20 percent the Alo variant and Anaheim, Balcom, Calleguas, and San Andreas soils.

Alo soils are well drained. They have a dark grayish

brown clay surface layer. At a depth of 24 to 40 inches is weathered shale or sandstone, or both. Bosanko soils also are well drained. They have a dark gray clay surface layer. At a depth of 22 to 38 inches is weathered shale or sandstone or both.

This association is used mostly for barley, pasture, and range. Citrus is grown on some of the better sites. Some areas are used for urban development.

7. Cienega-Anaheim-Soper association

Strongly sloping to very steep, somewhat excessively drained and well drained sandy loams, loams, clay loams, gravelly loams, and cobbly loams on coastal foothills

This association is in the foothills between Corona Del Mar and San Clemente east and northeast to the Santa Ana Mountains, east and northeast of the terraces and flood plains from El Toro to Tustin and Orange, and northeast and north of the terraces and flood plains near Anaheim to Buena Park to the Los Angeles and San Bernardino County lines. The soils formed in material weathered from sandstone, shale, and conglomerate. Slopes are 9 to 75 percent. The plant cover is brush and annual grasses and forbs. Elevation ranges from 100 to 4,000 feet. The average annual air temperature is 59 to 62° F., and the frost-free season is 200 to 350 days.

This association occupies 15 percent of the survey area. It is about 40 percent Cienega soils; 30 percent Anaheim soils; 15 percent Soper soils; and 15 percent Alo, Balcom, Calleguas, Gabino, Nacimiento, San Andreas, and Yorba soils.

Cienega soils are somewhat excessively drained. They have a light brownish gray and pale brown sandy loam surface layer 5 to 19 inches thick underlain by soft sandstone.

Anaheim soils are well drained and have a grayish brown loam or clay loam surface layer 20 to 36 inches thick. The underlying material is weathered sandstone or shale or both.

Soper soils are well drained and typically have a brown loam, gravelly loam, or cobbly loam surface layer and a reddish brown gravelly clay loam subsoil. At a depth of 20 to 32 inches is weathered conglomerate or sandstone or both.

This association is used mainly for range. Some areas are used for urban development.

Somewhat Excessively Drained and Well Drained, Strongly Sloping to Very Steep Soils of the Santa Ana Mountains

The one association in this group makes up about 25 percent of the survey area. It is in the mountains, on uplands. The soils are somewhat excessively drained and well drained sandy loams and silt loams that formed in material weathered mostly from granitic, metabasic, and metasedimentary rocks.

Elevation ranges from 1,000 to 4,000 feet. The average annual precipitation, mainly rainfall, is 16 to 25 inches, and the average annual air temperature is about 59° F. The frost-free season is 210 to 300 days.

This association is used mainly for wildlife habitat,

to the Balcom soil, that have a dark gray surface layer.

If the soil is bare, runoff is rapid and the erosion hazard is high. Available water capacity is 3.3 to 5.0 inches. The effective rooting depth is 24 to 30 inches.

Present land use is range and watershed. Capability unit VIe-1 (19); Clayey range site; Storie index 18.

114—Balcom-Rock outcrop complex, 15 to 50 percent slopes. This moderately steep to steep mapping unit occurs as somewhat oblong areas of 5 to 100 acres. The Balcom soil has a profile similar to the one described as typical of the series, but the soil depth is about 4 inches less. Rock outcrop occupies 10 to 20 percent of the surface area.

About 5 percent of this mapping unit is included areas of Cienega sandy loam and 10 percent Calleguas clay loam.

If the soil is bare, runoff is rapid and the erosion hazard is high. Available water capacity is 3.5 to 5.0 inches. The effective rooting depth is 24 to 30 inches.

Present land use is range and watershed. Capability unit VIe-1 (19); Clayey range site; Storie index 18.

Beaches

115—Beaches consists of sandy, gravelly, or cobbly coastal shores that are washed and reworked by tidal and wave action. These areas may be partly covered with water during high tides or stormy periods. They support little or no vegetation and have no agricultural value. Some are excellent recreational areas.

Runoff is very slow, and the erosion hazard is high.

Present land use is recreation and urban development. Capability unit VIIIw-1 (19); range site not assigned; Storie index less than 10 (nonagricultural).

Blasingame Series

The Blasingame series consists of well drained soils in the mountains. These soils formed in material weathered from metamorphic or granitic rocks. Slopes are 9 to 65 percent. Elevation ranges from 1,000 to 3,500 feet. The vegetation is chiefly brush; some areas have scattered oaks and annual grasses. Precipitation is 18 to 25 inches, and the mean annual air temperature is 58 to 61° F. The frost-free season is 225 to 300 days.

In a typical profile the surface layer is brown loam 6 inches thick. The subsoil is yellowish red clay loam about 20 inches thick. The substratum to a depth of 50 inches is reddish yellow weathered andesite bedrock. It grades to unweathered rock within several feet.

The soil is slightly acid in the surface layer and medium acid in the subsoil. It is moderately slowly permeable.

Blasingame soils are used for range, watershed, and wildlife.

Typical profile of Blasingame loam, 9 to 30 percent slopes, in Orange County, along Santiago Truck Trail about 1/2 mile east of Morrow Trail, NW1/4SW1/4 sec. 35, T. 5 S., R. 7 W.

A11—0 to 1 inch; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plas-

tic; common very fine, fine, and medium roots; common very fine, fine, and few medium and coarse tubular pores; slightly acid; abrupt smooth boundary.

A12—1 to 6 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, medium and coarse roots; common very fine and medium tubular pores; slight acid; clear wavy boundary.

B1—0 to 8 inches; reddish brown (5YR 5/2) loam, dark reddish brown (5YR 3/2) moist; weak medium subangular blocky structure; hard, firm, sticky and plastic; few very fine, fine, medium and coarse roots; common very fine, fine, and medium tubular pores; common thin clay films as bridges and lining pores; slightly acid; abrupt wavy boundary.

B21t—8 to 17 inches; yellowish red (5YR 5/4) clay loam, yellowish red (5YR 4/4) moist; strong medium and coarse angular blocky structure; very hard, firm, very sticky and very plastic; few very fine, fine, medium and coarse roots; few very fine and fine tubular pores; many moderately thick clay films on pedis; medium acid; gradual wavy boundary.

B22t—17 to 26 inches; yellowish red (5YR 5/4) clay loam, yellowish red (5YR 4/4) moist; moderate medium and coarse angular and subangular blocky structure; very hard, firm, sticky and plastic; few very fine, fine, medium, and coarse roots; few very fine and fine tubular pores; many moderately thick clay films on pedis; medium acid; abrupt wavy boundary.

Cr—26 to 50 inches; yellow, reddish yellow, and black weathered metamorphic rock, crushes easily; few clay film coatings, upper fractures.

The A horizon ranges from reddish brown to brown and yellowish brown in 10YR, 7.5YR, and 5YR hues. Texture is sandy loam or loam, with or without stones. Structure ranges from granular to subangular blocky. In places the soil is massive. Dry consistence ranges from slightly hard to hard. Reaction ranges from neutral to slightly acid. Thickness ranges from 3 to 10 inches.

The B1 horizon is 0 to 4 inches thick. The E horizon ranges from reddish brown to brown and yellowish red in 7.5YR and 5YR hues. Texture is sandy clay loam or clay loam with or without stones. Structure ranges from fine to coarse. Dry consistence ranges from hard to very hard. Thickness ranges from 17 to 20 inches.

The Cr horizon is weathered andesite, weathered metamorphic rock, or decomposed granitic rock.

116—Blasingame loam, 9 to 30 percent slopes. T strongly sloping to moderately steep soil generally occurs on the gentler, somewhat rolling lower mount-



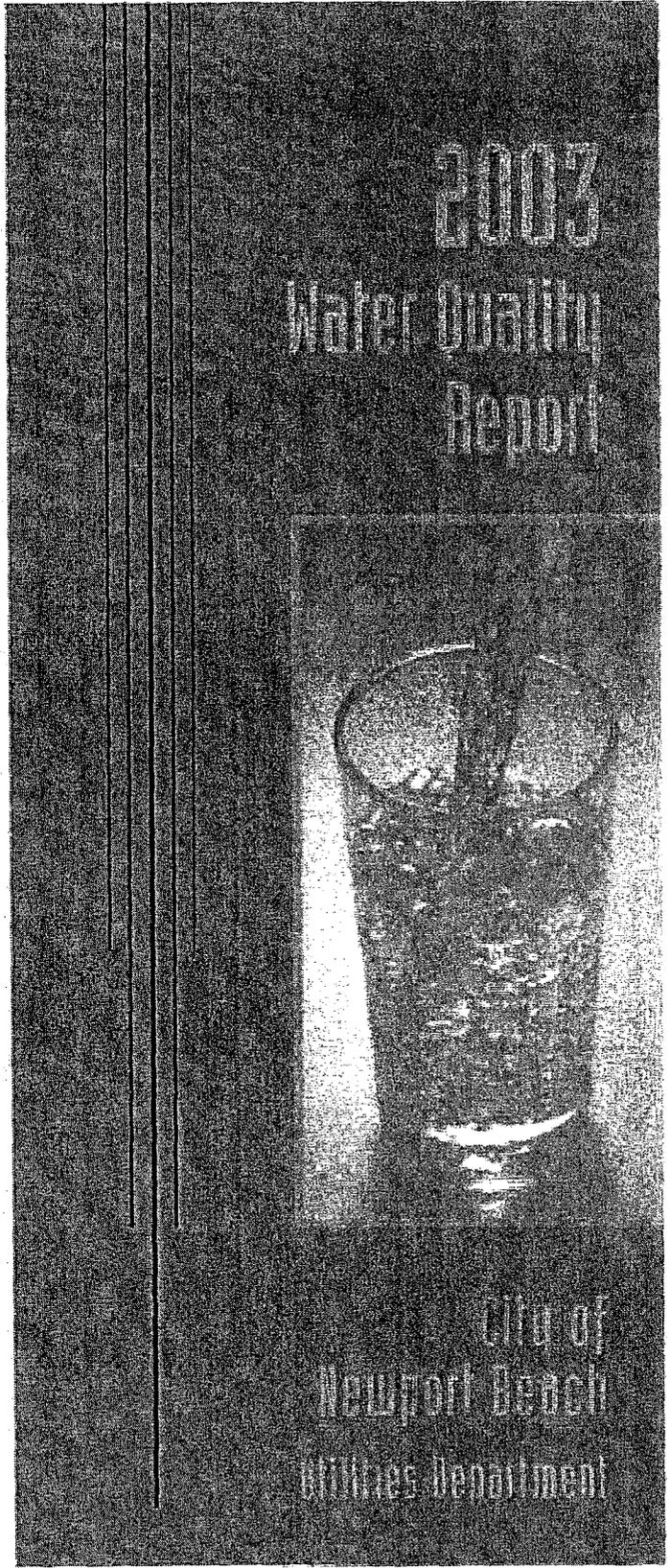
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The 2003 Water Quality Report

Drinking Water Quality

Since 1990, California water utilities have been providing an annual Water Quality Report to their customers. This year's report covers calendar year 2002 water quality testing, and has been prepared in compliance with new regulations called for in the 1996 reauthorization of the Safe Drinking Water Act. The reauthorization charged the United States Environmental Protection Agency (EPA) with updating and strengthening the tap water regulatory program and changed the report's due date to July 1.

EPA and the California Department of Health Services (DHS) are the agencies responsible for establishing drinking water quality standards. To ensure that your tap water is safe to drink, EPA and DHS prescribe regulations that limit the amount of certain contaminants in water

provided by public water systems. DHS regulations also establish limits for contaminants in bottled water that must provide the same protection for public health. The Federal Food and Drug Administration (FDA) also sets regulations for bottled water.

This information is important. Have someone translate it for you.

この情報は重要な情報です。誰かから訳して頂きたい。

Esta información es importante. Por favor pídales a alguien que se lo traduzca.

この情報は重要な情報です。誰かから訳して頂きたい。

هذه المعلومات هامة. يرجى ان يطلب احدكم ان يترجمها لك.

이 정보는 매우 중요한 것입니다. 꼭꼭조 누군가에게 물어볼 수 있는 사람에게 번역해 줄 것을 부탁하십시오.

Hãy báo cho ai đó có năng lực tin cậy quan trọng về nước uống của quý vị.
Hãy dịch ra tiếng nói chuyện với ai đó có năng lực.

If you have any questions about your water, please contact us for answers...

For information about this report or your water quality information in general, please contact Pete Antisa, Utilities Operations Manager at (949) 718-3401. The City of Newport Beach Council meetings begin at 7:00 p.m. on the second and fourth Tuesday of each month and are open to the public. Meetings are held at the Council Chambers located at 3300 Newport Boulevard, Newport Beach. Matters from the public are heard at each meeting. Please feel free to participate in these meetings.

For more information about the health effects of the listed contaminants in the following tables, call the Environmental Protection Agency hotline at (800) 426-4791.

The City of Newport Beach vigilantly safeguards its water supply and, as in years past, the water delivered to your home meets the standards required by the state and federal regulatory agencies. In some cases, your local utility goes beyond what is required to monitor for additional contaminants that have known health risks. For example, the Orange County Water District, which manages our groundwater basin, monitors our groundwater for the solvent 1,4-dioxane.

Unregulated contaminant monitoring helps EPA determine where certain contaminants occur and whether it needs to establish regulations for those contaminants.

What You Need to Know, ...and How it May Affect You

Sources of Supply

Your drinking water is a blend of mostly groundwater from the Orange County groundwater basin and also surface water imported by the Metropolitan Water District of Southern California. Metropolitan's imported water source is mostly the Colorado River, with augmentation by the State Water project from northern California. Your groundwater comes from a natural underground reservoir managed by the Orange County Water District that stretches from the Peck Barn and fans across the northwestern portion of Orange County, excluding the communities of Brea and La Habra, and stretching as far south as the 101 Freeway. Our wells are located in Fountain Valley.

Government Regulations of Potential Contaminants

Drinking water, including bottled water, may be reasonably expected to contain at least small amounts of some contaminants. As water travels over the surface of the land or through the layers of the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of human or animal activity. For most people, the presence of contaminants does not necessarily mean water may be a health risk.

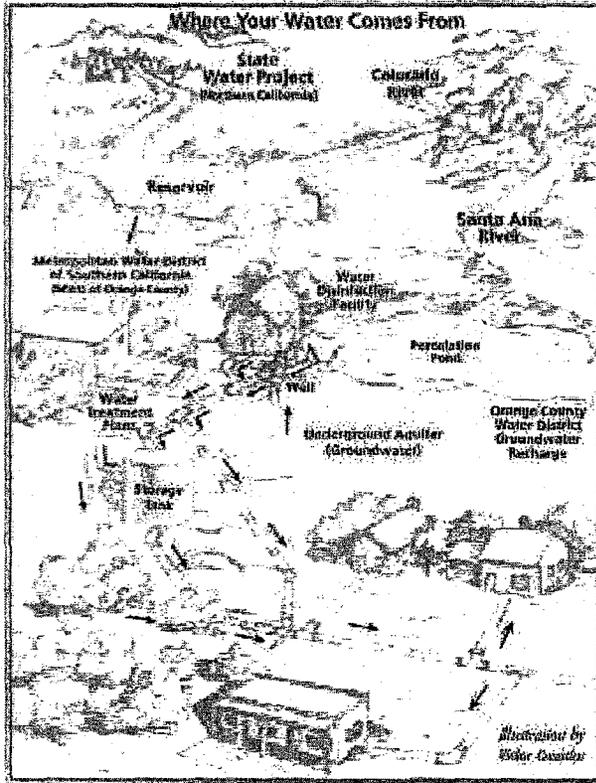
Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining and farming.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production or mining activities.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential use.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gasoline stations, urban storm water runoff and septic systems.

Cryptosporidium

Cryptosporidium is a microscopic organism that, when ingested, can cause diarrhea, fever, and other gastrointestinal symptoms. The organism comes from animal and/or human wastes and may be in surface water. The Metropolitan Water District of Southern California, which did not detect it in the water, tested your surface water for *Cryptosporidium* in 2002. If it ever is detected, *Cryptosporidium* is eliminated by an effective treatment combination including sedimentation, filtration and disinfection.

The EPA and the federal Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from EPA's safe drinking water hotline at (800) 426-4791 between 9 a.m. and 5 p.m. Eastern Time (6 a.m. to 2 p.m. in California).



Water Distribution System: Imported water supplies the Metropolitan Water District of Southern California (the MWD) of Orange County and is piped to your community by your local water retailer. Your groundwater is managed by the Orange County Water District and pumped out of the ground by your local water retailer.

Immuno-compromised people

Some people may be more vulnerable to constituents in the water than the general population. Immuno-compromised people, such as those with cancer who are undergoing chemotherapy, persons who have had organ transplants, people with HIV/AIDS or other immune system disorders, some elderly persons and infants can be particularly at risk of infections. These people should seek advice about drinking water from their healthcare providers.

Trihalomethanes and Disinfection

Trihalomethanes (THMs) are chemical byproducts of disinfecting drinking water. THMs are a group of four chemicals that are formed when chlorine reacts with naturally occurring organic and inorganic matter in water. The trihalomethanes are chloroform, bromodichloromethane, dibromochloromethane, and bromoform.

Chlorine disinfection has almost completely eliminated from our lives the risks of microbial waterborne diseases such as typhoid fever, cholera, and dysentery. However, the health benefit of chlorination has introduced some possible risks from THMs. Some scientific studies have linked THMs to increased risk of cancer. Other studies have linked THMs to reproductive problems, including miscarriage. A California study released in 1998 found an increase in miscarriage rate for women who drank 5 or more glasses of cold water containing more than 75 parts-per-billion total THMs. State and federal officials have cautioned that this study is not definitive and further investigation is now underway.

The maximum amount of total THMs allowed in drinking water is regulated by the U.S. EPA, which set a maximum annual average limit in drinking water of 100 parts per billion in 1979. Effective in January 2002, the Stage 1 Disinfectants / Disinfection Byproducts Rule reduces the total THM maximum annual average level to 80 parts per billion. Your drinking water complies with the Stage 1 Disinfectants / Disinfection Byproducts Rule (see the average THM value in the accompanying table). EPA is currently crafting a Stage 2 regulation that will further reduce allowable levels in drinking water.

1,4-Dioxane

1,4-dioxane is a new chemical contaminant primarily used as an industrial stabilizer to enhance performance of solvents in many manufacturing processes. It is found in foods (shrimp, chicken, tomatoes, etc) and food additives and ordinary household products (cosmetics, deodorants, and shampoos). The EPA has classified 1,4-dioxane as a probable human carcinogen. Due to limited data on health effects, there is no federal or state drinking water standard or maximum contaminant level (MCL). The California Department of Health Services (CDHS) has established an Action Level of 3 parts per billion (3 ppb) for 1,4-dioxane. CDHS also recommends that drinking water sources with 1,4-dioxane in excess of 500 ppb be removed from service. The City of Newport Beach's wells have been tested for 1,4-dioxane. Concentrations found in four wells ranged from non-detect to

12.7 ppb. All levels were well below the DHS's recommended level of 300 ppb to remove from service. CDHS does not recommend treatment or removal of wells from service at these levels. We believe that the 1,4-dioxane found in the groundwater originated from the seawater injection barrier, which uses recycled water. An industrial discharger was identified as the principal source in the recycled water. This source was eliminated and an additional advanced oxidation treatment step added to remove 1,4-dioxane from future injection water.



Lead

Infants and young children typically are more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about possible elevated lead levels in your home's water, you may wish to have your water tested by an independent laboratory and flush your tap for 30 seconds to 2 minutes before using the water. Additional information is available from the Safe Drinking Water Hotline at (800) 426-4791.

Import (Metropolitan) Water Assessment

In December 2002, Metropolitan Water District of Southern California completed its source water assessment of its Colorado River and State Water Project supplies. Colorado River supplies are considered to be most vulnerable to recreation, urban/storm water runoff, increasing urbanization in the watershed and wastewater. State Water Project supplies are considered to be most vulnerable to urban/storm water runoff, wildlife, agriculture, recreation and wastewater. A copy of the assessment can be obtained by contacting Metropolitan by phone at (213) 217-6850.

Groundwater Assessment

An assessment of the drinking water sources for City of Newport Beach Utilities Department was completed in December 2002. The groundwater sources are considered most vulnerable to the following activities not associated with detected contaminants: Dry cleaners, gas stations, and known contaminant plumes.

A copy of the complete assessment is available at Department of Health Services Office of Drinking Water, Santa Ana District, 28 Civic Center Plaza, Room 325, Santa Ana, CA 92701. You may request a summary of the assessment by contacting the City of Newport Beach Utilities Department at (949) 718-3401.

City of Newport Beach Groundwater Quality - 2003

Chemical	MCL	PHG (MCLG)	Average Amount	Range of Detections	MCL Violation?	Most Recent Sampling Date	Typical Source of Contaminant
Radioisotopes							
Alpha Radiation (pCi/L)	15	n/a	6.4	ND - 12	No	2002	Erosion of Natural Deposits
Radium (pCi/L)	5	n/a	<1	ND - 1.1	No	2002	Erosion of Natural Deposits
Uranium (pCi/L)	20	0.5	5.9	ND - 17	No	2002	Erosion of Natural Deposits
Inorganic Chemicals							
Arsenic (ppb)	50	n/a	<2.0	ND - 2.7	No	2002	Erosion of Natural Deposits
Barium (ppm)	1	(2)	<0.1	ND - 0.17	No	2002	Erosion of Natural Deposits
Fluoride (ppm)	2	1	0.31	0.23 - 0.40	No	2002	Erosion of Natural Deposits
Nickel (ppb)	100	12	4.0	ND - 11	No	2002	Erosion of Natural Deposits
Nitrate (ppm as N)	10	10	1.7	ND - 4.8	No	2002	Fertilizers, Septic Tanks
Nitrate+Nitrite (ppm as N)	10	10	1.7	ND - 4.8	No	2002	Fertilizers, Septic Tanks
Selenium (ppb)	50	(50)	<5.0	ND - 6.4	No	2002	Erosion of Natural Deposits
Secondary Standards*							
Chloride (ppm)	500*	n/a	53	16 - 85	No	2002	Erosion of Natural Deposits
Specific Conductance (umh/cm)	1,500*	n/a	703	416 - 1,060	No	2002	Erosion of Natural Deposits
Sulfate (ppm)	500*	n/a	107	37 - 204	No	2002	Erosion of Natural Deposits
Total Dissolved Solids (ppm)	1,000*	n/a	452	212 - 698	No	2002	Erosion of Natural Deposits
Turbidity (ntu)	5*	n/a	0.3	0.2 - 0.4	No	2002	Erosion of Natural Deposits
Unregulated Contaminants Requiring Monitoring							
Alkalinity (ppm as CaCO ₃)	Not Regulated	n/a	171	129 - 217	n/a	2002	Erosion of Natural Deposits
Bicarbonate (ppm)	Not Regulated	n/a	308	157 - 261	n/a	2002	Erosion of Natural Deposits
Boron (ppm)	Not Regulated	n/a	<0.1	ND - 0.15	n/a	2002	Erosion of Natural Deposits
Calcium (ppm)	Not Regulated	n/a	81	32 - 150	n/a	2002	Erosion of Natural Deposits
Hardness (ppm as CaCO ₃)	Not Regulated	n/a	255	93 - 483	n/a	2002	Erosion of Natural Deposits
Hardness (grains per gallon)	Not Regulated	n/a	15	5.6 - 29	n/a	2002	Erosion of Natural Deposits
Magnesium (ppm)	Not Regulated	n/a	11	1 - 26	n/a	2002	Erosion of Natural Deposits
pH (units)	Not Regulated	n/a	8.1	8.0 - 8.2	n/a	2002	Acidic hydrogen ions
Potassium (ppm)	Not Regulated	n/a	7	7.1 - 7.7	n/a	2002	Erosion of Natural Deposits
Sodium (ppm)	Not Regulated	n/a	21	43 - 59	n/a	2002	Erosion of Natural Deposits
Zinc (ppb)	Not Regulated	n/a	<5	ND - 4.3	n/a	2002	Erosion of Natural Deposits

ppb = parts per billion; ppm = parts per million; pCi/L = picocuries per liter; n/a = not applicable; ND = not detected; n/a = not applicable; * = secondary standard to maintain aesthetic quality (taste, odor, color)
 * Contaminant is regulated by a secondary standard to maintain aesthetic quality (taste, odor, color)

Lead and Copper Action Levels at Residential Taps

Contaminant	Action Level (AL)	Health Goal	90th Percentile Value	Site Exceeding AL / Number of Sites	AL Violation?	Typical Source of Contaminant
Copper (ppm)	1.3	0.77	0.27	0 / 10	No	Corrosion of household plumbing
Lead (ppb)	15	2	<5	0 / 30	No	Corrosion of household plumbing

Every sampling event, 20 residences are tested for lead and copper at the tap. The most recent set of samples was collected in 2003. Lead was not detected. Copper was detected in 20 samples, none of which exceeded the regulatory action level (AL) - a regulatory action level if the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Definitions

Public Health Goal (PHG)
 The level of a contaminant in drinking water below which there is no known or expected risk to health. Public health goals are set by the California Environmental Protection Agency.

Maximum Contaminant Level (MCL)
 The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the public health goals and maximum contaminant level goals as is technically and economically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

Maximum Contaminant Level Goal (MCLG)
 The level of contaminant in drinking water below which there is no known or expected risk to health. Maximum contaminant level goals are set by the EPA.

Action Levels (AL)
 Health-based advisory levels established by the State

Department of Health Services for chemicals non lead MCLs.

Primary Drinking Water Standard (PDWS)
 MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Regulatory Action Level
 The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Variance
 State or EPA permission not to meet an MCL of a treatment technique under certain conditions.

Do not allow us to monitor for some contaminants for less than one year because of monitoring of the contaminant in one other sample. Limit of one data point represents one year data one year old

Treatment Technique (TT)
 A required process intended to reduce the level of a contaminant in drinking water.

Measurements
 Water is sampled and tested throughout the year. Contaminants are measured in parts per million (ppm), parts per billion (ppb), parts per million (ppm), and parts per quadrillion (ppq). If this is difficult to imagine, think about these comparisons:
 Parts per million (mg/L): Parts per billion (ug/L)
 = 1 drop in 42 gallons = 1 drop in 16,000 gallons
 = 1 second in 12 days = 1 second in 32 years
 = 1 penny in \$10,000 = 1 penny in \$10 million
 = 1 inch in 16 miles = 1 inch in 16,000 miles

It is important to note, however, that even a small concentration of certain contaminants can adversely affect a water supply

City of Newport Beach Distribution System Water Quality

	MCL (MDDL/MRDL)	Average Amount	Range of Detections	MCL Violation?	Typical Source of Contaminant
Total Trihalomethenes (ppb)	80	54	5.0 - 120	No	Byproducts of chlorine disinfection
Halocetic Acids (ppb)	60	58	1.2 - 89	No	Byproducts of chlorine disinfection
Chlorine Residual (ppm)	(4 / 4)	0.25	0.2 - 1.5	No	Disinfectant added for treatment
Color (threshold odor number)	3*	1.4	1.2 - 2.2	No	Erosion of Natural Deposits
Color (color units)	15*	<5	ND - 15	No	Erosion of Natural Deposits
Turbidity (ntu)	5*	0.04	0.02 - 1.0	No	Erosion of Natural Deposits

Eight locations in the distribution system are tested quarterly for total trihalomethenes and haloacetic acids, eight are tested weekly for color, odor and turbidity.
 * = less than detection limit for reporting purposes; MRDL = Maximum Residual Disinfectant Level; MDDL = Maximum Residual Disinfectant Level (Goal);
 ntu = nephelometric turbidity units; ND = not detected; *Contaminant is regulated by a secondary standard to maintain aesthetic qualities (taste, odor, color).

Metropolitan Water District of Southern California Treated Surface Water

Chemical	MCL	PMG. or (MCL)	Average Amount	Range of Detections	MCL Violation?	Typical Source of Contaminant
Radioisotopes - Tested in 1999						
Alpha Radiation (pCi/L)	15	n/a	3.5	1.2 - 5.0	No	Erosion of natural deposits
Beta Radiation (pCi/L)	50	n/a	6.2	5.2 - 7.8	No	Decay of man-made or natural deposits
Combined Radium (pCi/L)	5	n/a	0.6	ND - 1.5	No	Erosion of natural deposits
Uranium (pCi/L)	20	0.5	2.5	ND - 5.8	No	Erosion of natural deposits
Organic Chemicals - Tested in 1997						
Fluoride (ppm)	2	1	0.23	0.20 - 0.27	No	Erosion of natural deposits
Nitrate and Nitrite as N (ppm)	10	10	<0.4	ND - 0.5	No	Agriculture runoff and sewage
Nitrate as N (ppm)	10	10	<0.4	ND - 0.5	No	Agriculture runoff and sewage
Inorganic Minerals* - Tested in 2002						
Chloride (ppm)	500*	n/a	86	76 - 98	No	Runoff or leaching from natural deposits
Color (color units)	15*	n/a	2	1 - 3	No	Runoff or leaching from natural deposits
Corrosivity (LSI)	non-corrosive	n/a	0.23	0.17 - 0.26	No	Elemental balance in water
Specific Conductance (µmhos/cm)	1,600*	n/a	443	768 - 939	No	Substances that form ions in water
Sulfate (ppm)	500*	n/a	171	126 - 207	No	Runoff or leaching of natural deposits
Total Dissolved Solids (ppm)	1,000*	n/a	499	424 - 567	No	Runoff or leaching of natural deposits
Turbidity (NTU)	5*	n/a	0.06	0.05 - 0.07	No	Runoff or leaching of natural deposits
Mineralized Chemicals - Tested in 2007						
Alkalinity (ppm)	Not Regulated	n/a	111	95 - 124	n/a	Runoff or leaching from natural deposits
Barium (ppb)	Not Regulated	n/a	130	110 - 130	n/a	Runoff or leaching from natural deposits
Calcium (ppm)	Not Regulated	n/a	54	41 - 65	n/a	Runoff or leaching from natural deposits
Magnesium (ppm)	Not Regulated	n/a	24	21 - 26	n/a	Runoff or leaching from natural deposits
Perchlorate (ppb)	Not Regulated	n/a	<4	ND - 4	n/a	Rocket fuel discharged to the Colorado River
pH (pH units)	Not Regulated	n/a	8	8	n/a	Hydrogen ion concentration
Potassium (ppm)	Not Regulated	n/a	3.8	3.7 - 4.2	n/a	Runoff or leaching from natural deposits
Sodium (ppm)	Not Regulated	n/a	88	74 - 89	n/a	Runoff or leaching from natural deposits
Hardness (ppm)	Not Regulated	n/a	232	192 - 258	n/a	Runoff or leaching of natural deposits
Hardness (grains/gal)	Not Regulated	n/a	14	11 - 15	n/a	Runoff or leaching of natural deposits

ppb = parts-per-billion; ppm = parts-per-million; pCi/L = picocuries per liter; NTU = nephelometric turbidity units; ND = not detected; * = average is less than the detection limit for reporting purposes;
 MCL = Maximum Contaminant Level; MCLGL = Federal MCL Goal; PMG = California Public Health Goal; n/a = not applicable; LSI = Langelier Saturation Index; µmhos/cm = micromhos-per-centimeter.
 * Contaminant is regulated by a secondary standard to maintain aesthetic qualities (taste, odor, color).

Turbidity - combined filter effluent	Treatment Technique	Turbidity Measurements	TV Violation?	Typical Source of Contaminant
1) Highest single turbidity measurement	0.3 NTU	0.14	No	Soil run-off
2) Percentage of samples less than 0.3 NTU	95%	100	No	Soil run-off

Turbidity is a measure of the cloudiness of the water, an indicator of particulate matter, some of which might include harmful microorganisms. Low turbidity in Metropolitan's treated water is a good indicator of effective filtration. Turbidity is called a treatment technique (TT). A secondary technique is required process, based on testing the level of contaminants in drinking water that are difficult and sometimes impossible to measure directly. ntu = nephelometric turbidity unit.

Information Collection Rule Disinfection By-Products in Metropolitan Water District Finished Water
 Data Collected August 1997 - November 1998

Chemical	Average Amount (ppb)	Range of Detections (ppb)	Typical Source of Contaminant
Disinfection By-Products			
Haloacetonitriles	7.8	5.1 - 11	Formed by the reaction with chlorine disinfectant
Haloacetonol	1.7	0.7 - 2.7	Formed by the reaction with chlorine disinfectant
Chloral Hydrate	3.8	1.5 - 6.1	Formed by the reaction with chlorine disinfectant
Total Organic Halogen	11.9	7.8 - 15.5	Formed by the reaction with chlorine disinfectant
Cyanogen Chloride	1.7	0.5 - 2.3	Formed by the reaction with chlorine disinfectant

The Information Collection Rule (ICR) is a multi-year national monitoring program administered by the U.S. Environmental Protection Agency. The primary purpose of the ICR is to gather nationwide occurrence data on chemicals which may be formed during drinking water disinfection. The results of the ICR will assist the EPA in regulating many of these disinfection by-products over the next 5 years.
 ppb = parts-per-billion.

APPENDIX D
PROFESSIONAL QUALIFICATIONS

SUMMARY OF EXPERIENCE

Mr. Brian R. Smith has extensive experience in delivering real estate due-diligence services to lenders and owners that have included Property Condition Assessments (PCAs), Phase I Environmental Assessments (ESAs), Probable Maximum Loss (PML) evaluations, Transaction Screening, Construction Monitoring, and Peer Review evaluations. During the last 5 years alone, Mr. Smith has visited over 1,000 properties on a regional and national basis and provided concise and accurate written reports that have helped to strengthen the client's position with each transaction. Mr. Smith is experienced with a wide range of commercial property types including multi-family, retail, industrial, office, hotel and resort, and mobile home communities. He also is experienced in many "wall street" and "main street" protocols including Fannie Mae, Freddie Mac, and various HUD programs. Mr. Smith is a registered Architect in California, has previously been affiliated with BOMA, AIA, and had NCARB certification. He has also had training as an asbestos inspector.

RELEVANT PROJECT EXPERIENCE

- Developed and executed over 1,000 PCA/ESA/PML or Combo Site Assessments using ASTM and client specific protocols on diverse properties to include major industrial facilities, shopping centers, residential developments, mobile home parks and in numerous states in the US. Consulting services provided included research of specific state and local regulatory requirements and advising clients as to the potential impact on proposed real estate developments, acquisitions, and industrial operations.
- Non-ASTM PCA tasks performed as part of the PCA/Construction Monitoring or Seller evaluation assessments included documentation reviews, estimating, municipality reviews and ADA analysis.
- Non-ASTM Phase I tasks performed as part of the Phase I assessments included asbestos inspection, sampling and analysis, radon testing, and lead-based paint assessment.
- Planned, directed, and coordinated activities of designated projects to ensure that goals or objectives of the project were accomplished within prescribed time frame and funding parameters.
- Team leaderships and multiple specialty consultant coordination on non-debt or equity type scopes.
- Developed and implemented Standard Procedures for preventative maintenance programs.
- Developed Property evaluation protocols for owner-based Real Estate portfolios including property management in various state and local departments and other non-profit organizations.

EDUCATION

AA Degree	Diablo Valley College
Continuing Architectural Studies	University of California
Continuing Financial Management	Brigham Young University
Continuing Management and Leadership	JFK University

Courses

California Asbestos Inspector Course; Basic and Refresher
Various Due-Diligence Training Courses

PROFESSIONAL REGISTRATIONS

California Registered Architect, License C21451

PROFESSIONAL AFFILIATIONS (PAST AND CURRENT)

ICBO, BOMA, MBA

SUMMARY OF EXPERIENCE

Ms. Steiner has twelve years of experience in the environmental consulting field. She has successfully completed hundreds of project assignments including property transaction due diligence site assessments, Environmental Impact Studies, subsurface investigations, underground storage tank removals, air monitoring projects, regulatory compliance audits, and asbestos surveys. Ms. Steiner has also developed and implemented numerous Operations and Maintenance Plans for facilities containing asbestos/lead based paint and/or mold, and Best Management Procedures for commercial businesses handling hazardous/petroleum substances.

At EBI, Ms. Steiner specializes in managing environmental due diligence assessments, site investigations, and industrial compliance programs for real estate owners, developers and investors.

RELEVANT PROJECTS AND EXPERIENCE

- Performed and managed site investigations at over 300 sites, including Phase I Environmental Site Assessments, Phase II investigations, and identifying asbestos-containing building materials at buildings across the southwest including: Arizona, Nevada, New Mexico, and Montana.
- Performed and managed over 50 Phase I Environmental Site Assessments and NEPA studies in Arizona and Nevada for cellular equipment towers. Coordinated archaeological surveys and biological assessments in sensitive areas of Arizona as part of the NEPA studies.
- Directed environmental compliance associated with several federal facilities in New Mexico. Managed asbestos abatement, employee training for Asbestos Awareness and OSHA Awareness, and implementing Best Management Procedures for facilities with USTs and facilities that generate RCRA wastes.
- Provided on-site environmental compliance programs for commercial businesses in Arizona. Programs included facility operation overview and review of permits and registrations, implementing Best Management Procedures for RCRA materials and on-site employee training for Hazard Awareness. Successfully minimized hazardous waste generation at one facility from Large Quantity generation to Small Quantity.
- Provided health and safety overview for a technical staff of 20 at an environmental consulting firm. Performed safety audits at multi-contractor work sites, interfaced with OSHA inspectors, and reviewed Health and Safety Plans. Coordinated medical monitoring and respirator fit testing. Implemented a Respiratory Protection Plan.

EDUCATION

Bachelor of Science Environmental Science Arizona State University

CERTIFICATION/ PROFESSIONAL AFFILIATIONS

OSHA 40-Hour Hazardous Site Worker Health and Safety Training
OSHA 8-Hour Manager/Supervisor Course for Hazardous Waste Site Workers
EPA/AHERA Asbestos Building Inspector Training and Certification
EPA/AHERA Asbestos Management Planner Training and Certification

SUMMARY OF EXPERIENCE

Mr. Hasselbach has several years of experience in property transaction due diligence. He has successfully managed hundreds of project assignments including property transaction due diligence assessments, building condition engineering evaluations and construction administration activities.

At EBI, Mr. Hasselbach specializes in facilitating real estate transactions. He manages a wide range of due diligence assessment projects.

RELEVANT EXPERIENCE

Various Property Owners and Financial Institutions, Nationwide. Manages the preparation of property condition due diligence reports for numerous property owners and financial institutions for portfolios and individual projects throughout the country.

Vice President: Commercial real estate sales and investment banking. Liaison between high net worth real estate owners and institutional investors. During association I personally closed over \$50 million in commercial loans and purchase transactions. Evaluated and administered permanent and construction loans ranging from \$1 million to over \$50 million in amount for our clients. Ordered and reviewed loan documents and predications. Personally performed in-depth appraisals for correspondent lenders. Negotiated and disbursed loan proceeds. Asset management for our lenders. Personally managed \$100 million in loan portfolio.

Part of a specialized team that analyzed failing banks, credit companies and savings and loan's real estate portfolios. Intensive review of legal documents and loan documents were performed under extremely short time constraints. Duties also required on-site inspection of assets to value the properties existing net income versus potential income, as well as market valuation. During 2-year period, I managed acquisitions and sales of over 5 billion dollars and 50 million square feet of office, industrial and commercial properties.

Represented Travelers Insurance Hartford, Home Life of New York and Manufactures Life Insurance Company. Required cultivation of potential borrowers, analysis and underwriting of loan request, negotiating of legal document and in depth appraisal valuation of real estate.

Development of, and construction of residential and industrial parks in Southern California. Handled construction bids for all trades. Significant hands-on construction experience includes concrete, electrical, drywall, rough and finish carpentry, stucco, tiling, sewer, plumbing and site grading.

EDUCATION

California State University Northridge, Dual Majors, Bachelor of Science in Finance/Real Estate and Engineering. 1982. MBA completed in 1984.

APPENDIX E
REGULATORY DATABASE REPORT



The EDR Radius Map with GeoCheck[®]

**Newport Marina Apartments
919 Bayside Dr
Newport Beach, CA 92660**

Inquiry Number: 01072806.1r

October 28, 2003

***The Source* For Environmental Risk Management Data**

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

919 BAYSIDE DR
NEWPORT BEACH, CA 92660

COORDINATES

Latitude (North): 33.610500 - 33° 36' 37.8"
Longitude (West): 117.892800 - 117° 53' 34.1"
Universal Transverse Mercator: Zone 11
UTM X (Meters): 417174.3
UTM Y (Meters): 3719134.5
Elevation: 16 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property: 2433117-E8 NEWPORT BEACH, CA
Source: USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
CORRACTS..... Corrective Action Report
RCRIS-TSD..... Resource Conservation and Recovery Information System
RCRIS-LQG..... Resource Conservation and Recovery Information System
RCRIS-SQG..... Resource Conservation and Recovery Information System
ERNS..... Emergency Response Notification System

STATE ASTM STANDARD

AWP..... Annual Workplan Sites

EXECUTIVE SUMMARY

Cal-Sites.....	Calsites Database
Notify 65.....	Proposition 65 Records
Toxic Pits.....	Toxic Pits Cleanup Act Sites
SWF/LF.....	Solid Waste Information System
WMUDS/SWAT.....	Waste Management Unit Database
CA BOND EXP. PLAN.....	Bond Expenditure Plan
VCP.....	Voluntary Cleanup Program Properties
INDIAN UST.....	Underground Storage Tanks on Indian Land
CA FID UST.....	Facility Inventory Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT.....	Superfund (CERCLA) Consent Decrees
ROD.....	Records Of Decision
Delisted NPL.....	National Priority List Deletions
FINDS.....	Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS.....	Hazardous Materials Information Reporting System
MLTS.....	Material Licensing Tracking System
MINES.....	Mines Master Index File
NPL Liens.....	Federal Superfund Liens
PADS.....	PCB Activity Database System
DOD.....	Department of Defense Sites
US BROWNFIELDS.....	A Listing of Brownfields Sites
RAATS.....	RCRA Administrative Action Tracking System
TRIS.....	Toxic Chemical Release Inventory System
TSCA.....	Toxic Substances Control Act
SSTS.....	Section 7 Tracking Systems
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST.....	Aboveground Petroleum Storage Tank Facilities
CA WDS.....	Waste Discharge System
DEED.....	List of Deed Restrictions
NFE.....	Properties Needing Further Evaluation
NFA.....	No Further Action Determination
EMI.....	Emissions Inventory Data
REF.....	Unconfirmed Properties Referred to Another Agency
SCH.....	School Property Evaluation Program
Orange Co. Industrial Site...	List of Industrial Site Cleanups

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas.....	Former Manufactured Gas (Coal Gas) Sites
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BROWNFIELDS DATABASES

US BROWNFIELDS.....	A Listing of Brownfields Sites
VCP.....	Voluntary Cleanup Program Properties

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property. Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in *bold italics* are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STATE ASTM STANDARD

CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CHMIRS list, as provided by EDR, and dated 12/31/2002 has revealed that there are 4 CHMIRS sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
Not reported	301 EAST COAST HIGHWAY	1/8 - 1/4 N	5	9
<u>Lower Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
<i>JIM GRISET</i>	<i>829 HARBOR ISLAND DR</i>	<i>1/4 - 1/2 W</i>	<i>16</i>	<i>24</i>
Not reported	118 S. BAYFRONT	1/4 - 1/2 WSW	20	31
Not reported	504 S BAYFRONT	1/4 - 1/2 SW	F24	38

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, has revealed that there are 4 Cortese sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
GW CLEANUP-N.B.,PCH 18-HN	1000 COAST	1/8 - 1/4 NE	D10	16
<u>Lower Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
<i>UNOCAL / BALBOA ISLAND PR</i>	<i>504 BAY FRONT</i>	<i>1/8 - 1/4 SW</i>	<i>11</i>	<i>17</i>
<i>UNOCAL #1299</i>	<i>124 MARINE AVE</i>	<i>1/4 - 1/2 SSE</i>	<i>E17</i>	<i>26</i>
<i>BISBEE'S MARINE FUELS, IN</i>	<i>406</i>	<i>1/4 - 1/2 SW</i>	<i>F21</i>	<i>32</i>

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 04/02/2003 has revealed that there are 10

EXECUTIVE SUMMARY

LUST sites within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
FORMER SHELL STATION	990 COAST HWY E	1/8 - 1/4 NNE	8	13
MOBIL STATION #18-HND	1000 EAST COAST HIGHWAY	1/8 - 1/4 NE	D13	20
MOBIL #18-HND	1000 COAST HWY E	1/8 - 1/4 NE	D14	22
NEWPORT AUTO CENTER	445 E PACIFIC COAST HWY	1/4 - 1/2 NW	19	29
NEWPORT BEACH CARS L L C	455 E PACIFIC COAST HWY	1/4 - 1/2 NW	25	39
<u>Lower Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
UNOCAL / BALBOA ISLAND PR	504 BAY FRONT	1/8 - 1/4 SW	11	17
UNOCAL #1299	124 MARINE AVE	1/4 - 1/2 SSE	E17	26
UNOCAL S S #1299	124 MARINE	1/4 - 1/2 SSE	E18	28
BISBEE'S MARINE FUELS	406 BAY FRONT	1/4 - 1/2 SW	F22	34
BISBEES MARINE FUELS INC.	406 SOUTH BAY FRONT	1/4 - 1/2 SW	23	35

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 04/02/2003 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
W & J AUTOMOTIVE	1000 E COAST HWY	1/8 - 1/4 NE	D15	24

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
ROBERT WAYNE MORGAN	1000 E COAST HWY	1/8 - 1/4 NE	D12	19

STATE OR LOCAL ASTM SUPPLEMENTAL

DRYCLEANERS: A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaners' agents; linen supply; coin-operated laundries and cleaning; drycleaning plants except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

A review of the CLEANERS list, as provided by EDR, and dated 03/11/2003 has revealed that there is 1 CLEANERS site within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
BAYSIDE CLEANERS	1056 BAYSIDE DR	0 - 1/8 E	B4	8

EXECUTIVE SUMMARY

CA SLIC: SLIC Region comes from the California Regional Water Quality Control Board.

A review of the CA SLIC list, as provided by EDR, has revealed that there is 1 CA SLIC site within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
BAYSIDE CLEANERS	1056 BAYSIDE DR	0 - 1/8 E	B4	8

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency

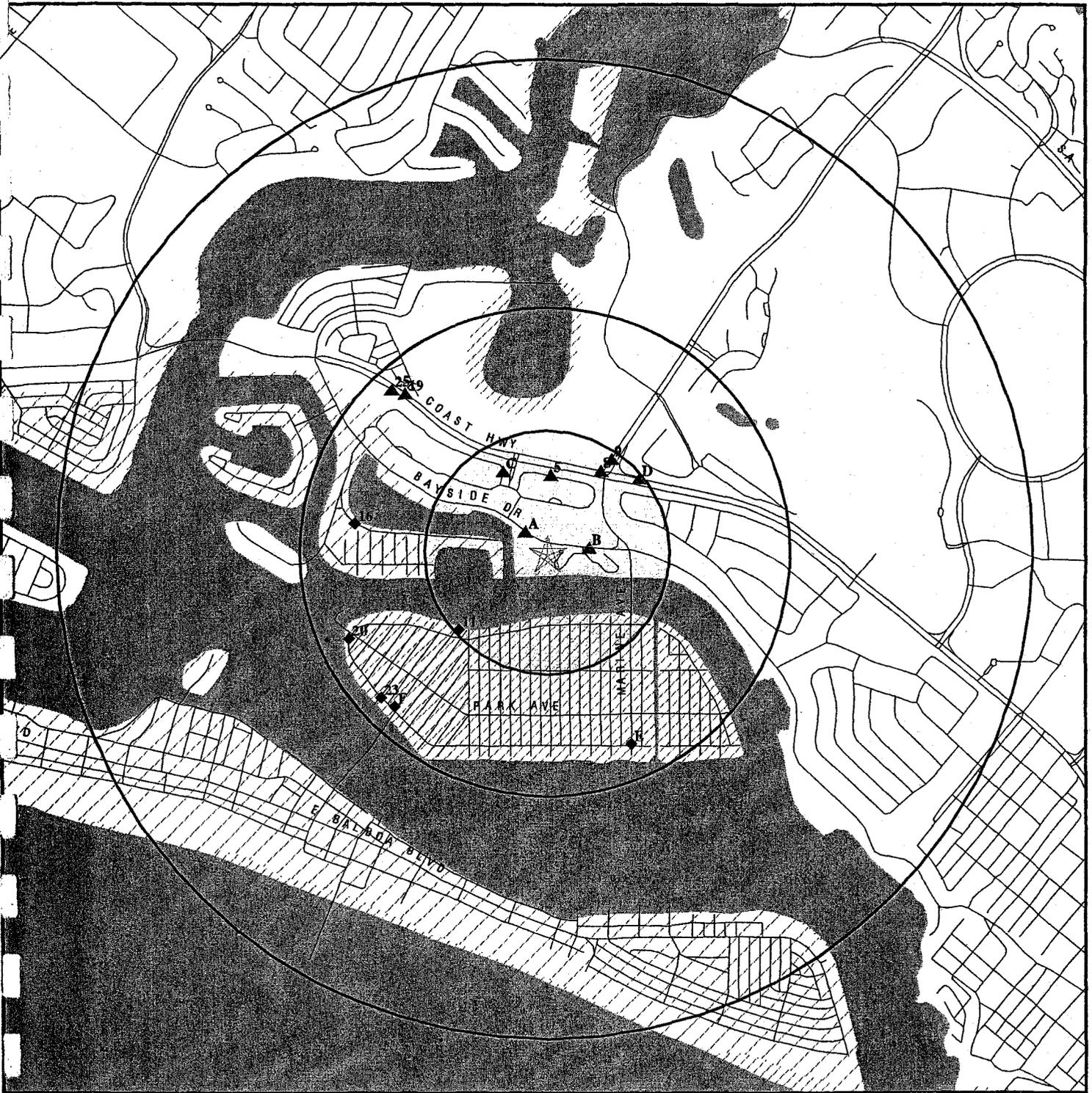
A review of the HAZNET list, as provided by EDR, has revealed that there are 8 HAZNET sites within approximately 0.25 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Dist / Dir</u>	<u>Map ID</u>	<u>Page</u>
THE IRVINE CO	900 BAYSIDE DR	0 - 1/8 NW	A1	6
1X THE IRVINE CO	900 BAYSIDE DR	0 - 1/8 NW	A2	6
THE PHOTO LAB	1048 BAYSIDE DR	0 - 1/8 E	B3	6
BAYSIDE CLEANERS	1056 BAYSIDE DR	0 - 1/8 E	B4	8
PROMONTORY POINT APARTMENTS	200 PROMONTORY DRIVE WE	1/8 - 1/4 NNW	C6	10
1X PROMONTORY POINT APTS	200 PROMONTORY DRIVE WE	1/8 - 1/4 NNW	C7	12
NALCO CHEMICAL COMPANY INC	1107 JAMBOREE RD	1/8 - 1/4 NE	9	15
MOBIL STATION #18-HND	1000 EAST COAST HIGHWAY	1/8 - 1/4 NE	D13	20

EXECUTIVE SUMMARY

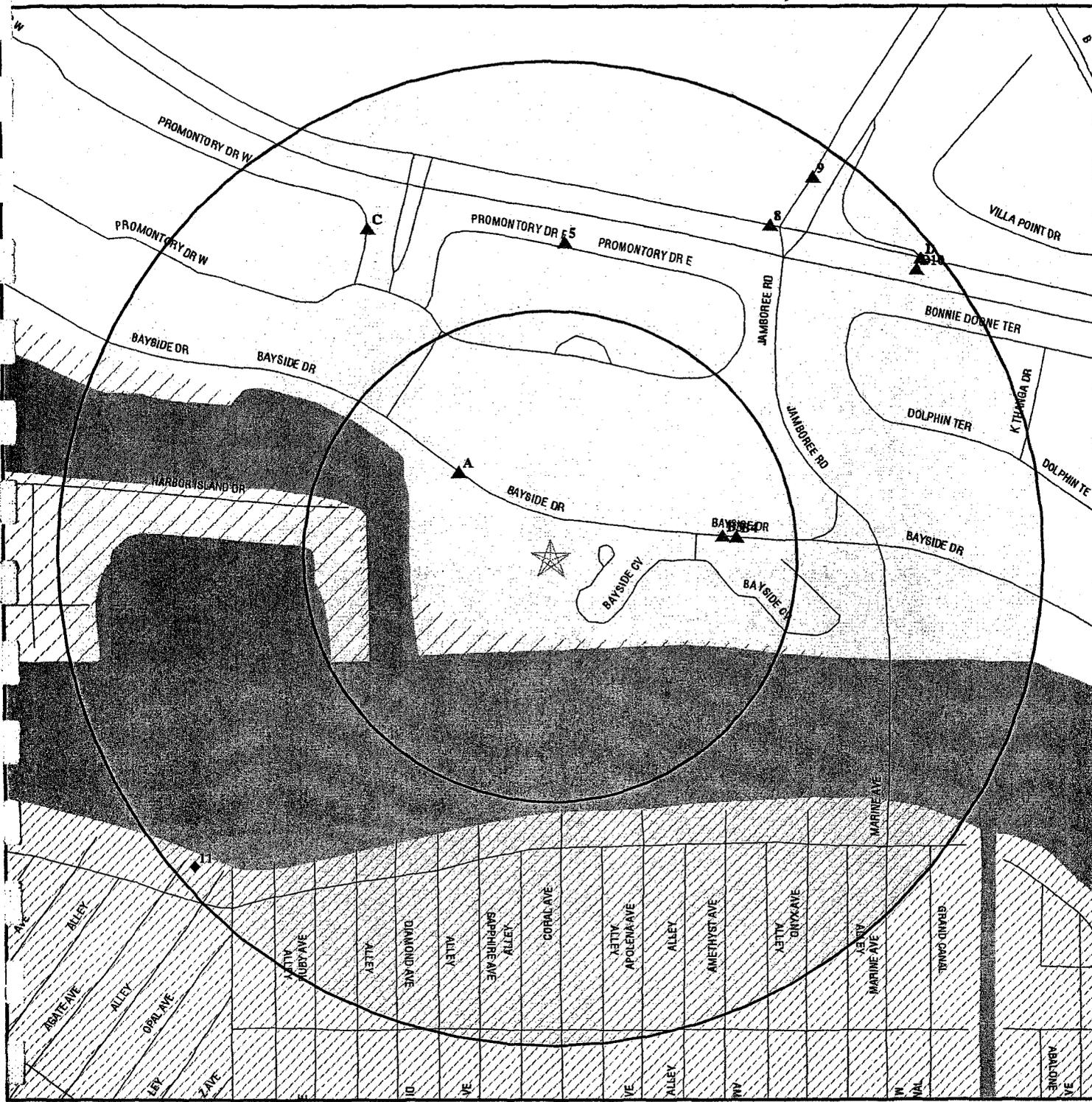
Due to poor or inadequate address information, the following sites were not mapped:

<u>Site Name</u>	<u>Database(s)</u>
LORAL AEROSPACE AERONUTRONIC	PADS, FINDS, RCRIS-LQG,
RITZ CLEANERS	RCRIS-TSD, CORRACTS, CERC-NFRAP
BERGSTROM FAMILY CLEANERS	RCRIS-SQG, FINDS, HAZNET, CLEANERS
NEWPORT TERRACE LF	RCRIS-SQG, FINDS, HAZNET, CLEANERS
COYOTE CANYON SANITARY LANDFILL	SWF/LF
UNOCAL #4898	SWF/LF
UNITED OIL COMPANY	LUST
SHELL OIL	LUST
SHELL OIL	LUST
ARCO SS# 1030	LUST
FORMER SHELL SERVICE STATION	LUST
MOBIL S S #18-HG7	LUST
BAXTER'S RESTAURANT	LUST
MOBIL S S #18-HND	LUST
SHELL OIL	LUST
MOBIL #18-HND	UST
JAZZ SEMICONDUCTOR INC	UST
NEWPORT CORPORATE TOWER	UST
STATION #3797	HIST UST
UNION OIL SERVICE STATION #379	HIST UST
TEXACO	HIST UST
NEWPORT PLACE	CA FID UST
UNOCAL SERVICE STATION #3797	HAZNET
FOX PHOTO INC	HAZNET
RAPID GAS #32	HAZNET
SANDERSON J RAY CORP	HAZNET
EQUILON ENTERPRISES LLC	HAZNET
SOUTHERN CALIFORNIA EDISON	HAZNET
HOLLIS AND ASSOCIATES	HAZNET
NEWPORT PRINTERS	HAZNET
DRY CLEANERS	RCRIS-SQG, FINDS
SHELL SERVICE STATION	RCRIS-SQG, FINDS
NEWPORT FAB L L C	FINDS, RCRIS-LQG
NEWPORT BANNING RANCH	Orange Co. Industrial Site



- ★ Target Property
- ◆ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- N Oil & Gas pipelines
- ▨ 100-year flood zone
- ▩ 500-year flood zone
- Federal Wetlands
- ▤ Areas of Concern

TARGET PROPERTY:	Newport Marina Apartments	CUSTOMER:	EnviroBusiness, Inc.
ADDRESS:	919 Bayside Dr	CONTACT:	dakerblom
CITY/STATE/ZIP:	Newport Beach CA 92660	INQUIRY #:	01072806.1r
LAT/LONG:	33.6105 / 117.8928	DATE:	October 28, 2003 5:54 pm



- ★ Target Property
- ◆ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

- N Oil & Gas pipelines
- ▨ 100-year flood zone
- ▨ 500-year flood zone
- Areas of Concern
- Federal Wetlands



TARGET PROPERTY: Newport Marina Apartments
ADDRESS: 919 Bayside Dr
CITY/STATE/ZIP: Newport Beach CA 92660
LAT/LONG: 33.6105 / 117.8928

CUSTOMER: EnviroBusiness, Inc.
CONTACT: dakerblom
INQUIRY #: 01072806.1r
DATE: October 28, 2003 5:54 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<u>FEDERAL ASTM STANDARD</u>								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRIS-TSD		0.500	0	0	0	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
<u>STATE ASTM STANDARD</u>								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		1.000	0	0	0	0	NR	0
CHMIRS		0.500	0	1	3	NR	NR	4
Cortese		0.500	0	2	2	NR	NR	4
Notify 65		1.000	0	0	0	0	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
LUST		0.500	0	4	6	NR	NR	10
CA Bond Exp. Plan		1.000	0	0	0	0	NR	0
UST		0.250	0	1	NR	NR	NR	1
VCP		1.000	0	0	0	0	NR	0
INDIAN UST		TP	NR	NR	NR	NR	NR	0
CA FID UST		0.250	0	0	NR	NR	NR	0
HIST UST		0.250	0	1	NR	NR	NR	1
<u>FEDERAL ASTM SUPPLEMENTAL</u>								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
DOD		TP	NR	NR	NR	NR	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
<u>STATE OR LOCAL ASTM SUPPLEMENTAL</u>								
AST		TP	NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CLEANERS		0.250	1	0	NR	NR	NR	1
CA WDS	TP		NR	NR	NR	NR	NR	0
DEED	TP		NR	NR	NR	NR	NR	0
NFE	TP		NR	NR	NR	NR	NR	0
NFA	TP		NR	NR	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
REF	TP		NR	NR	NR	NR	NR	0
SCH	TP		NR	NR	NR	NR	NR	0
CA SLIC		0.500	1	0	0	NR	NR	0
HAZNET		0.250	4	4	NR	NR	NR	1
Orange Co. Industrial Site	TP		NR	NR	NR	NR	NR	8
<u>EDR PROPRIETARY HISTORICAL DATABASES</u>								
Coal Gas		1.000	0	0	0	0	NR	0
<u>BROWNFIELDS DATABASES</u>								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
VCP		1.000	0	0	0	0	NR	0

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

Database(s) EDR ID Number
EPA ID Number

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

A1 THE IRVINE CO HAZNET S103990926
NW 900 BAYSIDE DR N/A
< 1/8 NEWPORT BEACH, CA 92660
336 ft.

Site 1 of 2 in cluster A

Relative:
Higher

HAZNET:

Gepaid: CAC001255688
TSD EPA ID: CAL000027741
Gen County: Orange
Tsd County: 5
Tons: 6.7424
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: THE IRVINE CO
Telephone: (000) 000-0000
Mailing Address: PO BOX 6370
NEWPORT BEACH, CA 92658
County Orange

Actual:
20 ft.

A2 1X THE IRVINE CO HAZNET S102796812
NW 900 BAYSIDE DR N/A
< 1/8 NEWPORT BEACH, CA 92660
336 ft.

Site 2 of 2 in cluster A

Relative:
Higher

HAZNET:

Gepaid: CAC000906352
TSD EPA ID: IRC957100891
Gen County: Orange
Tsd County: 99
Tons: 6.6244
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 550 NEWPORT CENTER DR
NEWPORT BEACH, CA 92660
County Orange

Actual:
20 ft.

B3 THE PHOTO LAB HAZNET S100848902
East 1048 BAYSIDE DR N/A
< 1/8 NEWPORT BEACH, CA 92660
462 ft.

Site 1 of 2 in cluster B

Relative:
Higher

HAZNET:

Gepaid: CAL000068348
TSD EPA ID: CAD981402522
Gen County: Orange
Tsd County: Kern
Tons: .0025
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: ANDY SONG
Telephone: (714) 759-8056

Actual:
20 ft.

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

EDR ID Number
EPA ID Number
Database(s)

THE PHOTO LAB (Continued)

S100848902

Mailing Address: 1048 BAYSIDE DR
NEWPORT BEACH, CA 92660 - 7462
County Orange
Gepaid: CAL000068348
TSD EPA ID: CAD981402522
Gen County: Orange
Tsd County: Kern
Tons: .0218
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: ANDY SONG
Telephone: (714) 759-8056
Mailing Address: 1048 BAYSIDE DR
NEWPORT BEACH, CA 92660 - 7462
County Orange
Gepaid: CAL000068348
TSD EPA ID: CAD003963592
Gen County: Orange
Tsd County: Santa Clara
Tons: 2.7520
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: ANDY SONG
Telephone: (714) 759-8056
Mailing Address: 1048 BAYSIDE DR
NEWPORT BEACH, CA 92660 - 7462
County Orange
Gepaid: CAL000068348
TSD EPA ID: CAD003963592
Gen County: Orange
Tsd County: Santa Clara
Tons: .6880
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: ANDY SONG
Telephone: (714) 759-8056
Mailing Address: 1048 BAYSIDE DR
NEWPORT BEACH, CA 92660 - 7462
County Orange
Gepaid: CAL000068348
TSD EPA ID: CAD003963592
Gen County: Orange
Tsd County: Santa Clara
Tons: 6.2546
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: ANDY SONG
Telephone: (714) 759-8056
Mailing Address: 1048 BAYSIDE DR
NEWPORT BEACH, CA 92660 - 7462
County Orange

The CA HAZNET database contains 2 additional records for this site.
Please click here or contact your EDR Account Executive for more information.

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

THE PHOTO LAB (Continued)

S100848902

B4 BAYSIDE CLEANERS
East 1056 BAYSIDE DR
< 1/8 NEWPORT BEACH, CA 92660
499 ft.

HAZNET 1000382114
CA SLIC N/A
CLEANERS

Site 2 of 2 in cluster B

Relative:
Higher

CA Cleaners:
Create Date: 06/17/88
Inactive Date: / /
EPA Id: CAD982050999
County: Orange

Actual:
20 ft.

HAZNET:
Gepaid: CAD982050999
TSD EPA ID: CAD981397417
Gen County: Orange
Tsd County: Los Angeles
Tons: .0000
Waste Category:
Disposal Method: Recycler
Contact: PETER HACATORYAN
Telephone: (949) 760-0550
Mailing Address: 1056 BAYSIDE DR
NEWPORT BEACH, CA 92660
County Orange

Gepaid: CAD982050999
TSD EPA ID: CAD981397417
Gen County: Orange
Tsd County: Los Angeles
Tons: 1.0382
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Recycler
Contact: PETER HACATORYAN
Telephone: (949) 760-0550
Mailing Address: 1056 BAYSIDE DR
NEWPORT BEACH, CA 92660
County Orange

Gepaid: CAD982050999
TSD EPA ID: CAD981397417
Gen County: Orange
Tsd County: Los Angeles
Tons: 1.6722
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Recycler
Contact: PETER HACATORYAN
Telephone: (949) 760-0550
Mailing Address: 1056 BAYSIDE DR
NEWPORT BEACH, CA 92660
County Orange

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

BAYSIDE CLEANERS (Continued)

1000382114

Gepaid: CAD982050999
TSD EPA ID: CAD981397417
Gen County: Orange
Tsd County: Los Angeles
Tons: .1251
Waste Category: Halogenated solvents (chloroform, methyl chloride, perchloroethylene, etc.)
Disposal Method: Recycler
Contact: PETER HACATORYAN
Telephone: (949) 760-0550
Mailing Address: 1056 BAYSIDE DR
NEWPORT BEACH, CA 92660
County Orange

Gepaid: CAD982050999
TSD EPA ID: CAT000613976
Gen County: Orange
Tsd County: Orange
Tons: .6240
Waste Category: Liquids with halogenated organic compounds > 1000 mg/l
Disposal Method: Transfer Station
Contact: PETER HACATORYAN
Telephone: (949) 760-0550
Mailing Address: 1056 BAYSIDE DR
NEWPORT BEACH, CA 92660
County Orange

The CA HAZNET database contains 5 additional records for this site.
Please click here or contact your EDR Account Executive for more information.

SLIC Region 8:

Facility ID: 286
Type: Soil
Region: 8
Facility Status: Closed
Lead Agency: Regional Board
Cross Street: Not reported
Sub Release: PCE
Staff: WDM
Location Code: NB-1
Thomas Bros map 919-C1
Program: SLIC
CAO Number: Not reported
ACL Number: Not reported
Permit Number: Not reported
Complexity: Not reported
Comments: Not reported

5
North
1/8-1/4
844 ft.

301 EAST COAST HIGHWAY
NEWPORT BEACH, CA 92663

CHMIRS S100276892
N/A

Relative:
Higher

CHMIRS:

Actual:
70 ft.

OES Control Number: 9100733
Chemical Name: Not reported
Extent of Release: Not reported
Property Use: Not reported
Incident Date: 20-AUG-91
Date Completed: 20-AUG-91

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

(Continued)

S100276892

Time Completed : 940
Agency Id Number : 30055
Agency Incident Number : 114545
OES Incident Number : 9100733
Time Notified : 147
Surrounding Area : Not reported
Estimated Temperature : Not reported
Property Management : Not reported
More Than Two Substances Involved? : N
Special Studies 1 : Not reported
Special Studies 2 : Not reported
Special Studies 3 : Not reported
Special Studies 4 : Not reported
Special Studies 5 : Not reported
Special Studies 6 : Not reported
Responding Agency Personnel # Of Injuries : 0
Responding Agency Personnel # Of Fatalities : 0
Resp Agency Personnel # Of Decontaminated : 0
Others Number Of Decontaminated : 0
Others Number Of Injuries : 0
Others Number Of Fatalities : 0
Vehicle Make/year : Not reported
Vehicle License Number : Not reported
Vehicle State : Not reported
Vehicle Id Number : Not reported
CA/DOT/PUC/ICC Number : Not reported
Company Name : Not reported
Reporting Officer Name/ID : B/C A.J. WAGNER
Report Date : 07-OCT-91
Comments : Yes
Facility Telephone Number : 714 644-3103
Waterway Involved : Not reported
Waterway : Not reported
Spill Site : Not reported
Cleanup By : Not reported
Containment : Not reported
What Happened : Not reported
Type : Not reported
Other : Not reported
Chemical 1 : Not Reported
Chemical 2 : Not Reported
Chemical 3 : Not Reported
Date/Time : Not reported
Evacuations : Not reported

C6 PROMONTORY POINT APARTMENTS
NNW 200 PROMONTORY DRIVE WEST
1/8-1/4 NEWPORT BEACH, CA 92660
1004 ft.

HAZNET S103982833
N/A

Site 1 of 2 in cluster C

Relative:
Higher

Actual:
61 ft.

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

EDR ID Number
EPA ID Number
Database(s)

PROMONTORY POINT APARTMENTS (Continued)

S103982833

HAZNET:

Gepaid: CAL000004480
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 5.0568
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: IRVINE COMPANY THE
Telephone: (000) 000-0000
Mailing Address: 8 EXECUTIVE CIR/PO BOX 19528
IRVINE, CA 92623 - 9528
County Orange

Gepaid: CAL000005345
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 2.1070
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: IRVINE APARTMENT COMMUNITIES
Telephone: (714) 720-5500
Mailing Address: PO BOX 57060
IRVINE, CA 92619 - 7060
County Orange

Gepaid: CAL000004480
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 5.0568
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: IRVINE COMPANY THE
Telephone: (000) 000-0000
Mailing Address: 8 EXECUTIVE CIR/PO BOX 19528
IRVINE, CA 92623 - 9528
County Orange

Gepaid: CAL000004480
TSD EPA ID: CAL000027741
Gen County: Orange
Tsd County: 5
Tons: 10.9564
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: IRVINE COMPANY THE
Telephone: (000) 000-0000
Mailing Address: 8 EXECUTIVE CIR/PO BOX 19528
IRVINE, CA 92623 - 9528
County Orange

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

PROMONTORY POINT APARTMENTS (Continued)

S103982833

Gepaid: CAL000004480
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 2.5284
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: IRVINE COMPANY THE
Telephone: (000) 000-0000
Mailing Address: 8 EXECUTIVE CIR/PO BOX 19528
IRVINE, CA 92623 - 9528
County Orange

The CA HAZNET database contains 2 additional records for this site.
Please click here or contact your EDR Account Executive for more information.

C7
NNW
1/8-1/4
1004 ft.

1X PROMONTORY POINT APTS
200 PROMONTARY DRIVE WEST
NEWPORT BEACH, CA 92660

HAZNET S103639665
N/A

Site 2 of 2 in cluster C

Relative:
Higher

Actual:
61 ft.

HAZNET:
Gepaid: CAC000077325
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: .8428
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 200 PROMONTARY DR WEST
NEWPORT BEACH, CA 92660
County Orange
Gepaid: CAC000077325
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 1.6856
Waste Category: Asbestos-containing waste
Disposal Method: Not reported
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 200 PROMONTARY DR WEST
NEWPORT BEACH, CA 92660
County Orange
Gepaid: CAC000077325
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 1.6856
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 200 PROMONTARY DR WEST

Map ID
Direction
Distance
Distance (ft.)
Elevation

MAP FINDINGS

1X PROMONTORY POINT APTS (Continued)

EDR ID Number
EPA ID Number

Database(s)

NEWPORT BEACH, CA 92660
County Orange

S103639665

8
NNE
1/8-1/4
1065 ft.

FORMER SHELL STATION
990 COAST HWY E
NEWPORT BEACH, CA 92660

LUST S102430341
N/A

Relative:
Higher

Actual:
79 ft.

State LUST:

Cross Street: JAMBOREE
Qty Leaked: Not reported
Case Number: 083002129T
Reg Board: 8
Chemical: Gasoline
Lead Agency: Local Agency
Local Agency: 0
Case Type: Other ground water affected
Status: Remedial action (cleanup) Underway
Review Date: 03/11/1992
Workplan: 3/11/91
Pollution Char: 9/14/95
Remed Action: 5/10/00
Monitoring: Not reported
Close Date: Not reported
Release Date: 03/07/1997
Cleanup Fund Id: Not reported
Discover Date: 08/01/1990
Enforcement Dt: Not reported
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date: 10/01/1992
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim: Not reported
Leak Cause: Not reported
Leak Source: Not reported
MTBE Date: 06/09/1998
Max MTBE GW: 620 Parts per Billion
MTBE Tested: MTBE Detected. Site tested for MTBE & MTBE detected
Priority: 2B
Local Case #: 92UT086
Beneficial: Not reported
Staff: CAB
GW Qualifier: =
Max MTBE Soil: 23 Parts per Million
Soil Qualifier: =
Hydr Basin #: Not reported
Operator: Not reported
Oversight Prgm: Local Oversight Program UST
Oversight Prgm: LOP
Review Date: 03/07/1997
Stop Date: / /
Work Suspended: Not reported
Responsible Party: MARVIN KATZ
RP Address: 20945 S WILMINGTON
Global Id: T0605901569
Org Name: Not reported
Contact Person: Not reported

Confirm Leak: 03/11/1992
Prelim Assess: 3/11/91
Remed Plan: 9/14/95

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

FORMER SHELL STATION (Continued)

S102430341

MTBE Conc: 3
Mtbe Fuel: 1
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 8006619 Cross Street: JAMBOREE
Regional Board: 08
Local Case Num: 92UT086
Facility Status: Remedial action (cleanup) Underway
Staff: CARL BERHHARDT
Lead Agency: Local Agency
Local Agency: 30000L
Qty Leaked: Not reported
County: Orange
Review Date: 3/11/92 Confirm Leak: 3/11/92
Workplan: 3/11/91 Prelim Assess: 3/11/91
Pollution Char: 9/14/95 Remed Plan: 9/14/95
Remed Action: Not reported Monitoring: Not reported
Close Date: Not reported
Cleanup Fund Id: Not reported
Discover Date: 08/01/1990
Enforcement Dt: Not reported
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date: 10/01/1992
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim: Not reported
Lat/Lon: 33.6128458 / -117.8901714
Leak Cause: Not reported
Leak Source: Not reported
Beneficial: Not reported
MTBE Date: 6/9/98
MTBE Tested: YES
Max MTBE GW: 620
GW Qualifies: =
Max MTBE Soil: 23
Soil Qualifies: =
Hydr Basin #: UNNAMED BASIN
Operator: Not reported
Oversight Prgm: LOP
Priority: Not reported
Work Suspended: Not reported
Responsible Party: MARVIN KATZ
Well name: LPA REPORTED PRIMARY SOURCE
Distance From Lust: 9470.534051600300425835820126
Waste Disch Global Id: W0608900228
MTBE Class: C
Waste Disch Assigned Name: 4500228-001GEN
Case Type: Other Ground Water not used for drinking or no beneficial use
Global ID: T0605901569
How Stopped Date: / /

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

FORMER SHELL STATION (Continued)

S102430341

Organization Name: Not reported
Contact Person: Not reported
RP Address: 20945 S WILMINGTON
MTBE Concentration: 3
MTBE Fuel: 1
Case Number: 083002129T
Water System Name: OUTPOST, THE
Code Name: ORANGE
Agency Name: Not reported
Priority: 2B
State Expalnation: REMEDIAL ACTION UNDERWAY
Substance: GASOLINE
Staff: CARL BERHHARDT
Case Type: O
Summary: Not reported

LUST Region OR:
Facility Id: 92UT086
Site Number: RO0002957
Region: ORANGE
Case Type: Other ground water affected
Chemical: Gasoline
Date Closed: Not reported
Current Status: 7
Facility Status: 01

9
NE
1/8-1/4
1236 ft.

NALCO CHEMICAL COMPANY INC
1107 JAMBOREE RD
NEWPORT BEACH, CA 92660

HAZNET S100864380
N/A

Relative:
Higher

Actual:
78 ft.

HAZNET:
Gepaid: CAL000069602
TSD EPA ID: CAD008252405
Gen County: Orange
Tsd County: Los Angeles
Tons: .1000
Waste Category: Paint sludge
Disposal Method: Treatment, Incineration
Contact: NEWPORTER BEACH HOTEL INVEST
Telephone: (206) 441-9856
Mailing Address: 1107 JAMBOREE RD
NEWPORT BEACH, CA 92660 - 6219
County Orange
Gepaid: CAL000214700
TSD EPA ID: CAD009007626
Gen County: Orange
Tsd County: Los Angeles
Tons: 3.3712
Waste Category: Asbestos-containing waste
Disposal Method: Disposal, Land Fill
Contact: PATRIOT AMERICAN
Telephone: (214) 863-1000
Mailing Address: 1107 JAMBOREE RD
NEWPORT BEACH, CA 92660 - 6219
County Orange

MAP FINDINGS

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

Database(s) EDR ID Number
 EPA ID Number

NALCO CHEMICAL COMPANY INC (Continued)

S100864380

Gepaid: CAL000069602
 TSD EPA ID: CAT000613976
 Gen County: Orange
 Tsd County: Orange
 Tons: .1620
 Waste Category: Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
 Disposal Method: Transfer Station
 Contact: NEWPORTER BEACH HOTEL INVEST
 Telephone: (206) 441-9856
 Mailing Address: 1107 JAMBOREE RD
 NEWPORT BEACH, CA 92660 - 6219
 County Orange

Gepaid: CAL000069602
 TSD EPA ID: CAT000613976
 Gen County: Orange
 Tsd County: Orange
 Tons: .1800
 Waste Category: Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
 Disposal Method: Transfer Station
 Contact: NEWPORTER BEACH HOTEL INVEST
 Telephone: (206) 441-9856
 Mailing Address: 1107 JAMBOREE RD
 NEWPORT BEACH, CA 92660 - 6219
 County Orange

Gepaid: CAL000069602
 TSD EPA ID: CAD008252405
 Gen County: Orange
 Tsd County: Los Angeles
 Tons: .1250
 Waste Category: Paint sludge
 Disposal Method: Not reported
 Contact: NEWPORTER BEACH HOTEL INVEST
 Telephone: (206) 441-9856
 Mailing Address: 1107 JAMBOREE RD
 NEWPORT BEACH, CA 92660 - 6219
 County Orange

The CA HAZNET database contains 4 additional records for this site.
 Please click here or contact your EDR Account Executive for more information.

D10 GW CLEANUP-N.B.,PCH 18-HN
NE 1000 COAST
1/8-1/4 NEWPORT BEACH, CA 91505
1250 ft.

Cortese S101299876
N/A

Site 1 of 5 in cluster D

**Relative:
 Higher**

CORTESE:
 Reg Id: 8 302583001
 Region: CORTESE
 Reg By: Cleanup or abatement orders that concern the discharge of wastes that are hazardous materials

**Actual:
 90 ft.**

MAP FINDINGS

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

Database(s) EDR ID Number
 EPA ID Number

11 **UNOCAL / BALBOA ISLAND PR**
SW **504 BAY FRONT**
1/8-1/4 **BALBOA ISLAND, CA 92662**
1268 ft.

LUST **S103943484**
Cortese **N/A**

Relative:
Lower

State LUST:

Cross Street: PACIFIC COAST HWY
 Qty Leaked: Not reported
 Case Number 083000433T
 Reg Board: 8
 Chemical: Diesel
 Lead Agency: Regional Board
 Local Agency : 0
 Case Type: Other ground water affected
 Status: Case Closed
 Abate Method: Excavate and Dispose - remove contaminated soil and dispose in approved site

Actual:
1 ft.

Review Date: Not reported	Confirm Leak: Not reported
Workplan: Not reported	Prelim Assess: Not reported
Pollution Char: Not reported	Remed Plan: Not reported
Remed Action: 1/15/87	
Monitoring: Not reported	
Close Date: 05/12/1996	
Release Date: 12/02/1985	
Cleanup Fund Id : Not reported	
Discover Date : / /	
Enforcement Dt : Not reported	
Enf Type: Not reported	
Enter Date : 05/19/1987	
Funding: Not reported	
Staff Initials: JK	
How Discovered: OM	
How Stopped: Not reported	
Interim : Yes	
Leak Cause: UNK	
Leak Source: UNK	
MTBE Date : / /	
Max MTBE GW : 0 Parts per Billion	
MTBE Tested: Not Required to be Tested.	
Priority: Not reported	
Local Case # : 86UT039	
Beneficial: Not reported	
Staff : NOM	
GW Qualifier : Not reported	
Max MTBE Soil : Not reported	
Soil Qualifier : Not reported	
Hydr Basin #: Not reported	
Operator : Not reported	
Oversight Prgm: RB Lead Underground Storage Tank	
Oversight Prgm : UST	
Review Date : 08/09/1996	
Stop Date : / /	
Work Suspended : Not reported	
Responsible Party UNOCAL	
RP Address: 1432 NORTH MAIN STREET, ORANGE, CA 92667	
Global Id: T0605900347	
Org Name: Not reported	
Contact Person: Not reported	
MTBE Conc: 0	

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

UNOCAL / BALBOA ISLAND PR (Continued)

S103943484

Mtbe Fuel: 0
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 12034 Cross Street: PACIFIC COAST HWY
Regional Board: 08
Local Case Num: 86UT039
Facility Status: Case Closed
Staff: NANCY OLSON MARTIN
Lead Agency: Regional Board
Local Agency: 30000L
Abate Method: Excavate and Dispose - remove contaminated soil and dispose in approved site

Qty Leaked: Not reported
County: Orange
Review Date: Not reported Confirm Leak: Not reported
Workplan: Not reported Prelim Assess: Not reported
Pollution Char: Not reported Remed Plan: Not reported
Remed Action: Not reported Monitoring: Not reported
Close Date: 05/12/1996
Cleanup Fund Id : Not reported
Discover Date : Not reported
Enforcement Dt : Not reported
Enf Type: Not reported
Enter Date : 05/19/1987
Funding: Not reported
Staff Initials: JK
How Discovered: OM
How Stopped: Not reported
Interim : Yes
Lat/Lon : 33.6054759 / -117.8980156
Leak Cause: UNK
Leak Source: UNK
Beneficial: Not reported
MTBE Date : Not reported
MTBE Tested : NRQ
Max MTBE GW : Not reported
GW Qualifies : Not reported
Max MTBE Soil : Not reported
Soil Qualifies : Not reported
Hydr Basin #: UNNAMED BASIN
Operator : Not reported
Oversight Prgm : UST
Priority : Not reported
Work Suspended :Not reported
Responsible Party: UNOCAL
Well name: LPA REPORTED PRIMARY SOURCE
Distance From Lust: 12972.558343836155838334505223
Waste Disch Global Id: W0608900228
MTBE Class: *
Waste Disch Assigned Name: 4500228-001GEN
Case Type: Other Ground Water not used for drinking or no beneficial use
Global ID: T0605900347

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s)
EDR ID Number
EPA ID Number

UNOCAL / BALBOA ISLAND PR (Continued)

S103943484

How Stopped Date: //
Organization Name: Not reported
Contact Person: Not reported
RP Address: 1432 NORTH MAIN STREET, ORANGE, CA 92667
MTBE Concentration: 0
MTBE Fuel: 0
Case Number: 083000433T
Water System Name: OUTPOST, THE
Code Name: ORANGE
Agency Name: Not reported
Priority: Not reported
State Explanaton: CASE CLOSED
Substance: DIESEL
Staff: NANCY OLSON MARTIN
Case Type: O
Summary: Not reported

CORTESE:

Reg Id: 083000433T
Region: CORTESE
Reg By: Leaking Underground Storage Tanks

D12
NE
1/8-1/4
1277 ft.

ROBERT WAYNE MORGAN
1000 E COAST HWY
NEWPORT BEACH, CA 92660

HIST UST U001577448
N/A

Site 2 of 5 in cluster D

Relative:
Higher

Actual:
89 ft.

UST HIST:

Facility ID:	39186	Tank Used for:	PRODUCT
Tank Num:	1	Container Num:	1
Tank Capacity:	8000	Year Installed:	Not reported
Type of Fuel:	UNLEADED	Tank Construction:	Not reported
Leak Detection:	Stock Inventor	Telephone:	(714) 644-2381
Contact Name:	Not reported	Region:	STATE
Total Tanks:	4	Other Type:	Not reported
Facility Type:	Gas Station		
Facility ID:	39186	Tank Used for:	PRODUCT
Tank Num:	2	Container Num:	2
Tank Capacity:	6000	Year Installed:	Not reported
Type of Fuel:	REGULAR	Tank Construction:	Not reported
Leak Detection:	Stock Inventor	Telephone:	(714) 644-2381
Contact Name:	Not reported	Region:	STATE
Total Tanks:	4	Other Type:	Not reported
Facility Type:	Gas Station		
Facility ID:	39186	Tank Used for:	PRODUCT
Tank Num:	3	Container Num:	3
Tank Capacity:	6000	Year Installed:	Not reported
Type of Fuel:	PREMIUM	Tank Construction:	Not reported
Leak Detection:	Stock Inventor	Telephone:	(714) 644-2381
Contact Name:	Not reported	Region:	STATE
Total Tanks:	4	Other Type:	Not reported
Facility Type:	Gas Station		
Facility ID:	39186	Tank Used for:	WASTE
Tank Num:	4	Container Num:	4
Tank Capacity:	280	Year Installed:	Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

ROBERT WAYNE MORGAN (Continued)

U001577448

Type of Fuel: WASTE OIL Tank Construction: Not reported
Leak Detection: Stock Inventor
Contact Name: Not reported Telephone: (714) 644-2381
Total Tanks: 4 Region: STATE
Facility Type: Gas Station Other Type: Not reported

D13
NE
1/8-1/4
1277 ft.

MOBIL STATION #18-HND
1000 EAST COAST HIGHWAY
NEWPORT BEACH, CA 92660

HAZNET S103978092
LUST N/A

Site 3 of 5 in cluster D

Relative:
Higher

Actual:
89 ft.

State LUST:

Cross Street: 22ND STREET
Qty Leaked: Not reported
Case Number: 7T2220009
Reg Board: 7
Chemical: Gasoline
Lead Agency: Local Agency
Local Agency: 0
Case Type: Undefined
Status: Case Closed
Review Date: Not reported
Workplan: Not reported
Pollution Char: Not reported
Remed Action: Not reported
Monitoring: Not reported
Close Date: 08/25/1992
Release Date: 08/19/1991
Cleanup Fund Id: Not reported
Discover Date: 08/19/1991
Enforcement Dt: 1/1/65
Enf Type: None Taken
Enter Date: 06/06/1994
Funding: Not reported
Staff Initials: Not reported
How Discovered: OM
How Stopped: Not reported
Interim: Not reported
Leak Cause: UNK
Leak Source: UNK
MTBE Date: / /
Max MTBE GW: 0 Parts per Billion
MTBE Tested: Site NOT Tested for MTBE. Includes Unknown and Not Analyzed.
Priority: Not reported
Local Case #: 91-536
Beneficial: Not reported
Staff: RT
GW Qualifier: Not reported
Max MTBE Soil: Not reported
Soil Qualifier: Not reported
Hydr Basin #: Not reported
Operator: R BEGINOR
Oversight Prgm: Local Oversight Program UST
Oversight Prgm: LOP
Review Date: 08/25/1992
Stop Date: / /
Work Suspended: Not reported
Responsible Party: MOBIL OIL CORPORATION

Confirm Leak: Not reported
Prelim Assess: Not reported
Remed Plan: Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

MOBIL STATION #18-HND (Continued)

S103978092

RP Address: Not reported
Global Id: T0606500723
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 0
Mtbe Fuel: 1
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 7:

Lead Agency: Local Agency
Status: Case Closed
Region: 7
Case Num: 7T2220009

HAZNET:

Gepaid: CAL000055897
TSD EPA ID: AZD982441263
Gen County: Orange
Tsd County: 99
Tons: 2.2000
Waste Category: Other organic solids
Disposal Method: Not reported
Contact: MOBIL
Telephone: (703) 846-5734
Mailing Address: PO BOX 142667
AUSTIN, TX 78714 - 2667
County Orange

Gepaid: CAL000055897
TSD EPA ID: CAD028409019
Gen County: Orange
Tsd County: Los Angeles
Tons: 1.0425
Waste Category: Tank bottom waste
Disposal Method: Treatment, Tank
Contact: MOBIL
Telephone: (703) 846-5734
Mailing Address: PO BOX 142667
AUSTIN, TX 78714 - 2667
County Orange

Gepaid: CAL000055897
TSD EPA ID: AZD982441263
Gen County: Orange
Tsd County: 99
Tons: 2.7500
Waste Category: Other organic solids
Disposal Method: Treatment, Incineration
Contact: MOBIL
Telephone: (703) 846-5734
Mailing Address: PO BOX 142667
AUSTIN, TX 78714 - 2667
County Orange

MAP FINDINGS

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation

Site

Database(s)

EDR ID Number
 EPA ID Number

MOBIL STATION #18-HND (Continued)

S103978092

Gepaid: CAL000055897
 TSD EPA ID: AZD982441763
 Gen County: Orange
 Tsd County: 0
 Tons: 1.0000
 Waste Category: Other organic solids
 Disposal Method: Treatment, Incineration
 Contact: MOBIL
 Telephone: (703) 846-5734
 Mailing Address: PO BOX 142667
 AUSTIN, TX 78714 - 2667
 County: Orange

D14
 NE
 1/8-1/4
 1277 ft.

**MOBIL #18-HND
 1000 COAST HWY E
 NEWPORT BEACH, CA 92625**

**LUST S105774253
 N/A**

Site 4 of 5 in cluster D

**Relative:
 Higher**

**Actual:
 89 ft.**

State LUST:
 Cross Street: JAMBOREE
 Qty Leaked: Not reported
 Case Number: 083000280T
 Reg Board: 8
 Chemical: Gasoline
 Lead Agency: Local Agency
 Local Agency: 0
 Case Type: Other ground water affected
 Status: Case Closed
 Abate Method: Remove Free Product - remove floating product from water table, Pump and Treat Ground Water - generally employed to remove dissolved contaminants, Vapor Extraction

Review Date: Not reported
 Workplan: 11/12/84
 Pollution Char: 7/23/90
 Remed Action: 11/12/84
 Monitoring: Not reported
 Close Date: 01/06/2000
 Release Date: 01/11/2000
 Cleanup Fund Id: Not reported
 Discover Date: 01/04/1982
 Enforcement Dt: 11/10/88
 Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
 Enter Date: 05/18/1987
 Funding: Not reported
 Staff Initials: JK
 How Discovered: Not reported
 How Stopped: Not reported
 Interim: Not reported
 Leak Cause: Not reported
 Leak Source: Not reported
 MTBE Date: 01/01/1965
 Max MTBE GW: 110 Parts per Billion
 MTBE Tested: MTBE Detected. Site tested for MTBE & MTBE detected
 Priority: 2B
 Local Case #: 84UT016
 Beneficial: Not reported
 Staff: RS

Confirm Leak: Not reported
 Prelim Assess: 11/12/84
 Remed Plan: 7/23/90

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

MOBIL #18-HND (Continued)

S105774253

GW Qualifier : =
Max MTBE Soil : Not reported
Soil Qualifier : Not reported
Hydr Basin #: Not reported
Operator : Not reported
Oversight Prgm: Local Oversight Program UST
Oversight Prgm : LOP
Review Date : 01/11/2000
Stop Date : / /
Work Suspended :Not reported
Responsible Party:STEVE PAO
RP Address: 3700 W 190TH ST TPT2
Global Id: T0605900217
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 1
Mtbe Fuel: 1
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 8006619 Cross Street: JAMBOREE
Regional Board: 08
Local Case Num: 84UT016
Facility Status: Case Closed
Staff: ROSE SCOTT
Lead Agency: Local Agency
Local Agency: 30000L
Abate Method: Remove Free Product - remove floating product from water table, Vapor
Extraction, Pump and Treat Ground Water - generally employed to remove
dissolved contaminants
Qty Leaked: Not reported
County: Orange
Review Date: Not reported Confirm Leak: Not reported
Workplan: 11/12/84 Prelim Assess: 11/12/84
Pollution Char: 7/23/90 Remed Plan: 7/23/90
Remed Action: Not reported Monitoring: Not reported
Close Date: 01/06/2000
Cleanup Fund Id : Not reported
Discover Date : 01/04/1982
Enforcement Dt : 11/10/88
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date : 05/18/1987
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Lat/Lon : 33.6128218 / -117.8900264
Leak Cause: Not reported
Leak Source: Not reported
Beneficial: Not reported
MTBE Date : 1/1/65
MTBE Tested : YES

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
 EPA ID Number

MOBIL #18-HND (Continued)

S105774253

Max MTBE GW : 110
 GW Qualifies : =
 Max MTBE Soil : Not reported
 Soil Qualifies : Not reported
 Hydr Basin #: UNNAMED BASIN
 Operator : Not reported
 Oversight Prgrm : LOP
 Priority : Not reported
 Work Suspended :Not reported
 Responsible Party:STEVE PAO
 Well name: LPA REPORTED PRIMARY SOURCE
 Distance From Lust: 9458.685376554732875216357405
 Waste Disch Global Id: W0608900228
 MTBE Class: Not reported
 Waste Disch Assigned Name: 4500228-001GEN
 Case Type: Other Ground Water not used for drinking or no beneficial use
 Global ID: T0605900217
 How Stopped Date: / /
 Organization Name: Not reported
 Contact Person: Not reported
 RP Address: 3700 W 190TH ST TPT2
 MTBE Concentration: 1
 MTBE Fuel: 1
 Case Number: 083000280T
 Water System Name: OUTPOST, THE
 Code Name: ORANGE
 Agency Name: Not reported
 Priority: 2B
 State Expalnation: CASE CLOSED
 Substance: GASOLINE
 Staff: ROSE SCOTT
 Case Type: O
 Summary: Not reported

D15 W & J AUTOMOTIVE
 NE 1000 E COAST HWY
 1/8-1/4 NEWPORT BEACH, CA 92660
 1277 ft.

UST U003779902
 N/A

Relative: Site 5 of 5 in cluster D
 Higher State UST:
 Facility ID: 2194
 Actual: Region: STATE
 89 ft. Local Agency: 30000

16 JIM GRISET
 West 829 HARBOR ISLAND DR
 1/4-1/2 NEWPORT BEACH, CA 92660
 2083 ft.

HAZNET S103972126
 CHMIRS N/A

Relative:
 Lower

Actual:
 14 ft.

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

JIM GRISET (Continued)

S103972126

HAZNET:

Gepaid: CAC001395728
TSD EPA ID: CAD099452708
Gen County: Orange
Tsd County: Los Angeles
Tons: .3461
Waste Category: Waste oil and mixed oil
Disposal Method: Recycler
Contact: JIM GRISET
Telephone: (000) 000-0000
Mailing Address: 444 N NEWPORT BLVD STE A
NEWPORT BEACH, CA 92667
County Orange

CHMIRS:

OES Control Number: 02-4296
Chemical Name: Gasoline
Extent of Release: Not reported
Property Use: Not reported
Incident Date: Not reported
Date Completed: Not reported
Time Completed: Not reported
Agency Id Number: Not reported
Agency Incident Number: Not reported
OES Incident Number: 02-4296
Time Notified: Not reported
Surrounding Area: Not reported
Estimated Temperature: Not reported
Property Management: Not reported
More Than Two Substances Involved?: Not reported
Special Studies 1: Not reported
Special Studies 2: Not reported
Special Studies 3: Not reported
Special Studies 4: Not reported
Special Studies 5: Not reported
Special Studies 6: Not reported
Responding Agency Personnel # Of Injuries: 0
Responding Agency Personnel # Of Fatalities: 0
Resp Agncy Personnel # Of Decontaminated: Not reported
Others Number Of Decontaminated: Not reported
Others Number Of Injuries: Not reported
Others Number Of Fatalities: Not reported
Vehicle Make/year: Not reported
Vehicle License Number: Not reported
Vehicle State: Not reported
Vehicle Id Number: Not reported
CA/DOT/PUC/ICC Number: Not reported
Company Name: Not reported
Reporting Officer Name/ID: Not reported
Report Date: Not reported
Comments: Not reported
Facility Telephone Number: Not reported
Waterway Involved: Yes
Waterway: Newport Harbor
Spill Site: Ship/Harbor/Port
Cleanup By: Fire Dept.
Containment: Yes

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
 EPA ID Number

JIM GRISET (Continued)

S103972126

What Happened : Substance was release when a burnt vessel was lifted from the water. Boat is currently out of the water. Affected land area has been foamed. Note: Fire Dept will conduct cleanup on land. Substance in water will be allowed to dissipate.

Type : Gal(s)
 Other : Not reported
 Chemical 1 : Not Reported
 Chemical 2 : Not Reported
 Chemical 3 : Not Reported
 Date/Time : 8/8/2002 2120
 Evacuations : 0

E17 UNOCAL #1299
SSE 124 MARINE AVE
1/4-1/2 BALBOA ISLAND, CA 92662
2264 ft.

LUST S102440268
Cortese N/A

Site 1 of 2 in cluster E

**Relative:
 Lower**

**Actual:
 8 ft.**

State LUST:
 Cross Street: BAY FRONT
 Qty Leaked: Not reported
 Case Number 083001024T
 Reg Board: 8
 Chemical: 80066191203
 Lead Agency: Local Agency
 Local Agency : 0
 Case Type: Other ground water affected
 Status: Case Closed
 Review Date: Not reported
 Workplan: 5/19/88
 Pollution Char: Not reported
 Remed Action: 8/6/91
 Monitoring: Not reported
 Close Date: 02/03/1993
 Release Date: 01/08/1993
 Cleanup Fund Id : Not reported
 Discover Date : 05/19/1988
 Enforcement Dt : Not reported
 Enf Type: Consent order/enforceable agreement to cooperative responsible parties (includes CAO)
 Enter Date : 09/26/1988
 Funding: Not reported
 Staff Initials: JK
 How Discovered: Not reported
 How Stopped: Not reported
 Interim : Not reported
 Leak Cause: Not reported
 Leak Source: Not reported
 MTBE Date : / /
 Max MTBE GW : 0 Parts per Billion
 MTBE Tested: Not Required to be Tested.
 Priority: Not reported
 Local Case # : 88UT146
 Beneficial: Not reported
 Staff : NOM
 GW Qualifier : Not reported
 Max MTBE Soil : Not reported
 Soil Qualifier : Not reported
 Hydr Basin #: Not reported

Confirm Leak: Not reported
 Prelim Assess: 5/19/88
 Remed Plan: Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s)
EDR ID Number
EPA ID Number

UNOCAL #1299 (Continued)

S102440268

Operator : Not reported
Oversight Prgm: Local Oversight Program UST
Oversight Prgm : LOP
Review Date : 01/08/1993
Stop Date : / /
Work Suspended :Not reported
Responsible Party:GERRY MACHINSKI
RP Address: P O BOX 85176
Global Id: T0605900810
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 0
Mtbe Fuel: 0
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 8006619,1203
Regional Board: 08
Local Case Num: 88UT146
Facility Status: Case Closed
Staff: NANCY OLSON MARTIN
Lead Agency: Local Agency
Local Agency: 30000L
Qty Leaked: Not reported
County: Orange
Review Date: Not reported
Workplan: 5/19/88
Pollution Char: Not reported
Remed Action: Not reported
Close Date: 02/03/1993
Cleanup Fund Id : Not reported
Discover Date : 05/19/1988
Enforcement Dt : Not reported
Enf Type: Consent order/enforceable agreement to cooperative responsible parties (includes CAO)
Enter Date : 09/26/1988
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Lat/Lon : 33.604827 / -117.8896814
Leak Cause: Not reported
Leak Source: Not reported
Beneficial: Not reported
MTBE Date : Not reported
MTBE Tested : NRQ
Max MTBE GW : Not reported
GW Qualifies : Not reported
Max MTBE Soil : Not reported
Soil Qualifies : Not reported
Hydr Basin #: UNNAMED BASIN
Operator : Not reported
Oversight Prgm : LOP

Cross Street: BAY FRONT

Confirm Leak: Not reported
Prelim Assess: 5/19/88
Remed Plan: Not reported
Monitoring: Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

UNOCAL #1299 (Continued)

S102440268

Priority : Not reported
Work Suspended :Not reported
Responsible Party:GERRY MACHINSKI
Well name: LPA REPORTED PRIMARY SOURCE
Distance From Lust: 12101.764512071463925332281603
Waste Disch Global Id: W0608900228
MTBE Class: *
Waste Disch Assigned Name: 4500228-001GEN
Case Type: Other Ground Water not used for drinking or no beneficial use
Global ID: T0605900810
How Stopped Date: / /
Organization Name: Not reported
Contact Person: Not reported
RP Address: P O BOX 85176
MTBE Concentration: 0
MTBE Fuel: 0
Case Number: 083001024T
Water System Name: OUTPOST, THE
Code Name: ORANGE
Agency Name: Not reported
Priority: Not reported
State Expalnation: CASE CLOSED
Substance: Not reported
Staff: NANCY OLSON MARTIN
Case Type: O
Summary: Not reported

CORTESE:

Reg Id: 083001024T
Region: CORTESE
Reg By: Leaking Underground Storage Tanks

E18 UNOCAL S S #1299
SSE 124 MARINE
1/4-1/2 BALBOA ISLAND, CA 92662
2264 ft.

LUST S102440222
N/A

Site 2 of 2 in cluster E

Relative:
Lower

Actual:
8 ft.

LUST Region OR:
Facility Id: 88UT146
Site Number: RO0002403
Region: ORANGE
Case Type: Ground water
Chemical: Waste Oil
Date Closed: 02/03/1993
Current Status: 9
Facility Status: 02

Facility Id: 88UT146
Site Number: RO0002403
Region: ORANGE
Case Type: Ground water
Chemical: Gasoline
Date Closed: 02/03/1993
Current Status: 9
Facility Status: 02

Map ID
Direction
Distance
Distance (ft.)
Elevation

MAP FINDINGS

UNOCAL S S #1299 (Continued)

Database(s)
EDR ID Number
EPA ID Number

S102440222

19
NW
1/4-1/2
2293 ft.

NEWPORT AUTO CENTER
445 E PACIFIC COAST HWY
NEWPORT BEACH, CA 92660

LUST U002096224
CA FID UST N/A

Relative:
Higher

Actual:
17 ft.

State LUST:
Cross Street: Not reported
Qty Leaked: Not reported
Case Number: 083001744T
Reg Board: 8
Chemical: Gasoline
Lead Agency: Local Agency
Local Agency: 0
Case Type: Other ground water affected
Status: Remedial action (cleanup) Underway
Review Date: Not reported
Workplan: 12/1/93
Pollution Char: 4/14/96
Remed Action: 3/7/97
Monitoring: Not reported
Close Date: Not reported
Release Date: 05/13/1996
Cleanup Fund Id: Not reported
Discover Date: / /
Enforcement Dt: Not reported
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date: 01/20/1991
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim: Not reported
Leak Cause: Not reported
Leak Source: Not reported
MTBE Date: 02/17/1998
Max MTBE GW: 59000 Parts per Billion
MTBE Tested: MTBE Detected, Site tested for MTBE & MTBE detected
Priority: 2B
Local Case #: 93UT087
Beneficial: Not reported
Staff: NOM
GW Qualifier: =
Max MTBE Soil: 0.05 Parts per Million
Soil Qualifier: <
Hydr Basin #: Not reported
Operator: Not reported
Oversight Prgm: Local Oversight Program UST
Oversight Prgm: LOP
Review Date: 05/13/1996
Stop Date: / /
Work Suspended: Not reported
Responsible Party: STEVE BRAHS
RP Address: 610 NEWPORT CENTER DR 1210
Global Id: T0605901312
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 3
Mtbe Fuel: 1

Confirm Leak: Not reported
Prelim Assess: 12/1/93
Remed Plan: 4/14/96

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

NEWPORT AUTO CENTER (Continued)

U002096224

Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 8006619 Cross Street: Not reported
Regional Board: 08
Local Case Num: 93UT087
Facility Status: Remedial action (cleanup) Underway
Staff: NANCY OLSON MARTIN
Lead Agency: Local Agency
Local Agency: 30000L
Qty Leaked: Not reported
County: Orange
Review Date: Not reported Confirm Leak: Not reported
Workplan: 12/1/93 Prelim Assess: 12/1/93
Pollution Char: 4/14/96 Remed Plan: 4/14/96
Remed Action: Not reported Monitoring: Not reported
Close Date: Not reported
Cleanup Fund Id : Not reported
Discover Date : Not reported
Enforcement Dt : Not reported
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date : 01/20/1991
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Lat/Lon : 33.6157516 / -117.8992856
Leak Cause: Not reported
Leak Source: Not reported
Beneficial: Not reported
MTBE Date : 2/17/98
MTBE Tested : YES
Max MTBE GW : 59000
GW Qualifies : =
Max MTBE Soil : .05
Soil Qualifies : <
Hydr Basin #: UNNAMED BASIN
Operator : Not reported
Oversight Prgm : LOP
Priority : Not reported
Work Suspended : Not reported
Responsible Party: STEVE BRAHS
Well name: LPA REPORTED PRIMARY SOURCE
Distance From Lust: 10201.398532951258060946868451
Waste Disch Global Id: W0608900228
MTBE Class: B
Waste Disch Assigned Name: 4500228-001GEN
Case Type: Other Ground Water not used for drinking or no beneficial use
Global ID: T0605901312
How Stopped Date: / /
Organization Name: Not reported
Contact Person: Not reported

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
 EPA ID Number

NEWPORT AUTO CENTER (Continued)

U002096224

RP Address: 610 NEWPORT CENTER DR 1210
 MTBE Concentration: 3
 MTBE Fuel: 1
 Case Number: 083001744T
 Water System Name: OUTPOST, THE
 Code Name: ORANGE
 Agency Name: Not reported
 Priority: 2B
 State Expalnation: REMEDIAL ACTION UNDERWAY
 Substance: GASOLINE
 Staff: NANCY OLSON MARTIN
 Case Type: O
 Summary: Not reported

FID:

Facility ID:	30003901	Regulate ID:	Not reported
Reg By:	Active Underground Storage Tank Location		
Cortese Code:	Not reported	SIC Code:	Not reported
Status:	Active	Facility Tel:	(714) 555-1212
Mail To:	Not reported P O BOX NEWPORT BEACH, CA 92660		
Contact:	Not reported	Contact Tel:	Not reported
DUNs No:	Not reported	NPDES No:	Not reported
Creation:	10/22/93	Modified:	00/00/00
EPA ID:	Not reported		
Comments:	Not reported		

20
 WSW
 1/4-1/2
 2314 ft.

118 S. BAYFRONT
 UNINCORPORATED COUNTY AREA, CA 0

CHMIRS S105657684
 N/A

Relative:
 Lower

Actual:
 5 ft.

CHMIRS:

OES Control Number:	98-0764
Chemical Name:	Oil and Fuel
Extent of Release:	Not reported
Property Use:	Not reported
Incident Date:	Not reported
Date Completed:	Not reported
Time Completed :	Not reported
Agency Id Number :	Not reported
Agency Incident Number :	Not reported
OES Incident Number :	98-0764
Time Notified :	Not reported
Surrounding Area :	Not reported
Estimated Temperature :	Not reported
Property Management :	Not reported
More Than Two Substances Involved? :	Not reported
Special Studies 1 :	Not reported
Special Studies 2 :	Not reported
Special Studies 3 :	Not reported
Special Studies 4 :	Not reported
Special Studies 5 :	Not reported
Special Studies 6 :	Not reported
Responding Agency Personel # Of Injuries :	0
Responding Agency Personel # Of Fatalities :	0
Resp Agency Personel # Of Decontaminated :	Not reported
Others Number Of Decontaminated :	Not reported

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
 EPA ID Number

(Continued)

S105657684

Others Number Of Injuries :	Not reported
Others Number Of Fatalities :	Not reported
Vehicle Make/year :	Not reported
Vehicle License Number :	Not reported
Vehicle State :	Not reported
Vehicle Id Number :	Not reported
CA/DOT/PUC/ICC Number :	Not reported
Company Name :	Not reported
Reporting Officer Name/ID :	Not reported
Report Date :	Not reported
Comments :	Not reported
Facility Telephone Number :	Not reported
Waterway Involved :	Yes
Waterway :	Newport Harbor
Spill Site :	Ship/Harbor/Port
Cleanup By :	Contractor
Containment :	Yes
What Happened :	50' X 30' sheen from sunken boat.
Type :	PETROLEUM
Other :	Not reported
Chemical 1 :	Not Reported
Chemical 2 :	Not Reported
Chemical 3 :	Not Reported
Date/Time :	2/15/98
Evacuations :	0

F21
 SW
 1/4-1/2
 2341 ft.

BISBEE'S MARINE FUELS, IN
 406
BALBOA ISLAND, CA 92662

Cortese S104750182
 San Diego Co. HMMD N/A

Site 1 of 3 in cluster F

Relative:
 Lower

CORTESE:
 Reg Id: 083000748T
 Region: CORTESE
 Reg By: Leaking Underground Storage Tanks

Actual:
 6 ft.

HMMD:

Facility ID:	H23163	Business Code:	PUBLIC UTILITIES
Inactive Indicator:	Active	Permit Expiration:	12/31
SIC:	Not reported	2nd Name:	ATTN: ROBERT LONN
Owner:	COX CABLE SAN DIEGO INC		
Mailing Address:	SAN DIEGO CA 92105, 5428	Fire Dept District:	Not reported
Corporate Code:	03	EPA ID:	Not reported
Census Tract #:	12700	Reinspection Date:	10/02
Inspection Date:	08/10/2001 0:00:00	Gas Station:	Not reported
Inspector Name:	NYAGA	Delinquent Flag:	Not Delinquent
Facility Contact:	DAVE LINDSAY		
Property Owner:	Not reported		
PO Address:	Not reported		
Tank Owner:	Not reported		
TO Address:	Not reported		
Last Update:	09/28/2001 0:00:00		
Last Delinquent Letter:	Not reported		
Last Letter Type:	30		
Violation Notice Issued:	Not reported		
Map Code/Business Plan on File:	Not reported		

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

BISBEE'S MARINE FUELS, IN (Continued)

S104750182

Business Plan Acceptance Date: 07/13/99
Reinspection Date Y2K Compatible: Oct 2002

HMMD DISCLOSURE INVENTORY:

Chemical Name: SULFURIC ACID; BATTERY ELECTROLYTE IN 36 ABSOLYTE II P
Item Number: D003
Stored at 1 Time: 153.00
Measurement Units: 0000000153
Carcinogen: Yes
Quantity Stored At One Time: 7664-93-9
Annual Quantity String: 153.00
Material Safety Data Sheet: P
1st Hazard Category: Not reported
2nd Hazard Category: IMMED HEALTH HAZRD
Storage Method: Not reported
Annual Qty String: 0000000153

Chemical Name: DIESEL FUEL
Item Number: D001
Stored at 1 Time: 2100.00
Measurement Units: 0000000800
Carcinogen: Yes
Quantity Stored At One Time: 68476-34-6
Annual Quantity String: 800.00
Material Safety Data Sheet: A
1st Hazard Category: Not reported
2nd Hazard Category: FIRE HAZARD
Storage Method: Not reported
Annual Qty String: 0000002100

Chemical Name: HEPTA FLUORO PROPANE; HALON; FREON FE (99%)
Item Number: D002
Stored at 1 Time: 2068.00
Measurement Units: 0000002068
Carcinogen: Yes
Quantity Stored At One Time: 431-89-0
Annual Quantity String: 2068.00
Material Safety Data Sheet: C
1st Hazard Category: Not reported
2nd Hazard Category: IMMED HEALTH HAZRD
Storage Method: Not reported
Annual Qty String: 0000002068

HMMD UNDERGROUND TANKS:

Tank Number: Not reported
Capacity (Gal): Not reported
Waste or Product: Not reported
Tank ID Number: Not reported
Tank Exempt: Not reported
Tank Contents: Not reported

HMMD WASTE STREAMS:

Inspection Date: 08/10/2001 0:00:00
Waste Code: 342.00
Qty at Inspection: 27.00
Measurement Unit: GAL
Treatment Method: RECYCLE
Waste Description: USED ANTIFREEZE
Carcinogen: No
Quantity String: 0000000027
Waste Item #: W001
Waste Name: ORGANIC LIQUIDS W/METALS
Annual Quantity: 27.00
Storage Method: METAL DRUMS,30 GALLONS
Haz Waste Hauler: A & S ENVIRONMENTAL RECOV
Annual Qty String: 0000000027

Inspection Date: 08/10/2001 0:00:00
Waste Code: 221.00
Qty at Inspection: 9.00
Measurement Unit: GAL
Treatment Method: RECYCLE
Waste Description: MOTOR OIL CHANGES
Carcinogen: No
Waste Item #: W002
Waste Name: WASTE OIL & MIXED OIL
Annual Quantity: 9.00
Storage Method: METAL DRUMS 6-110 GALLONS
Haz Waste Hauler: A & S ENVIRONMENTAL RECOV
Annual Qty String: 0000000009

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
 EPA ID Number

BISBEE'S MARINE FUELS, IN (Continued)

S104750182

Quantity String: 0000000009

HMMD VIOLATIONS:

Inspection Date: 06/04/1999 0:00:00 Occurrences: 01

Waste Code: Not reported

Type of Violation: GENERAL VIOLATION

Violation Description: PERSONNEL TRAINING RECORDS NOT AVAILABLE TO SHOW THAT PERSONNEL HAVE RECEIVED INITIAL AND ANNUAL REFRESHER TRAINING. CCR 2732(B)

Inspection Date: 06/04/1999 0:00:00 Occurrences: 01

Waste Code: Not reported

Type of Violation: GENERAL VIOLATION

Violation Description: BUSINESS PLAN INVENTORY DOES NOT LIST ALL HAZARDOUS MATERIALS ON SITE IN DISCLOSABLE QUANTITIES HSC 25504 (A), 25503.5

Inspection Date: 06/04/1999 0:00:00 Occurrences: 01

Waste Code: Not reported

Type of Violation: GENERAL VIOLATION

Violation Description: BUSINESS PLAN WAS NOT AMENDED WITHIN 30 DAYS FOR A 100% QUANTITY IN- CREASE,NEW DISCLOSABLE MATERIALS OR A CHANGE IN BUSINESS INFO.HSC 25505

HMMD ENVIRONMENTAL ASSESSMENT INFORMATION:

Case Status Date: Not reported

Case Type: Not reported

Case Status: Not reported

Release Occurrence Number: Not reported

Historical Name: Not reported

Date Release Began: Not reported

Lead Agency: Not reported

The CA HMMD database may contain additional details for this site.
 Please click here or contact your EDR Account Executive for more information.

F22
SW
1/4-1/2
2341 ft.

BISBEE'S MARINE FUELS
406 BAY FRONT
BALBOA ISLAND, CA 92662

LUST S104160903
N/A

Site 2 of 3 in cluster F

Relative:
Lower

LUST Region OR:

Facility Id: 88UT167
 Site Number: RO0002868
 Region: ORANGE
 Case Type: Ground water
 Chemical: Gasoline
 Date Closed: Not reported
 Current Status: 5
 Facility Status: 01

Actual:
6 ft.

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation

MAP FINDINGS

BISBEES MARINE FUELS INC.
406 SOUTH BAY FRONT
BALBOA, CA 92662

Database(s) EDR ID Number
 EPA ID Number

23
SW
1/4-1/2
2377 ft.

LUST **U001577463**
HIST UST **N/A**

Relative:
Lower

Actual:
6 ft.

State LUST:
 Cross Street: AGATE
 Qty Leaked: Not reported
 Case Number: 083000748T
 Reg Board: 8
 Chemical: Gasoline
 Lead Agency: Local Agency
 Local Agency: 0
 Case Type: Other ground water affected
 Status: No Action
 Review Date: Not reported
 Workplan: 5/5/88
 Pollution Char: Not reported
 Remed Action: Not reported
 Monitoring: Not reported
 Close Date: Not reported
 Release Date: 02/17/1988
 Cleanup Fund Id: Not reported
 Discover Date: 12/19/1987
 Enforcement Dt: Not reported
 Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
 Enter Date: 02/17/1988
 Funding: Not reported
 Staff Initials: JK
 How Discovered: Not reported
 How Stopped: Not reported
 Interim: Not reported
 Leak Cause: Not reported
 Leak Source: Not reported
 MTBE Date: 01/17/2002
 Max MTBE GW: 605000 Parts per Billion
 MTBE Tested: MTBE Detected. Site tested for MTBE & MTBE detected
 Priority: 2A
 Local Case #: 88UT167
 Beneficial: Not reported
 Staff: NOM
 GW Qualifier: =
 Max MTBE Soil: Not reported
 Soil Qualifier: Not reported
 Hydr Basin #: Not reported
 Operator: BISBEE, ROBERT J.
 Oversight Prgm: Local Oversight Program UST
 Oversight Prgm: LOP
 Review Date: 02/17/1988
 Stop Date: / /
 Work Suspended: Not reported
 Responsible Party: SEYMOUR BEEK
 RP Address: 410 S BAYFRONT
 Global Id: T0605900591
 Org Name: Not reported
 Contact Person: Not reported
 MTBE Conc: 2
 Mtbe Fuel: 1
 Water System Name: Not reported

Confirm Leak: Not reported
 Prelim Assess: 5/5/88
 Remed Plan: Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

BISBEES MARINE FUELS INC. (Continued)

U001577463

Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 8006619 Cross Street: AGATE
Regional Board: 08
Local Case Num: 88UT167
Facility Status: Preliminary site assessment underway
Staff: NANCY OLSON MARTIN
Lead Agency: Local Agency
Local Agency: 30000L
Qty Leaked: Not reported
County: Orange
Review Date: Not reported Confirm Leak: Not reported
Workplan: 5/5/88 Prelim Assess: 5/5/88
Pollution Char: Not reported Remed Plan: Not reported
Remed Action: Not reported Monitoring: Not reported
Close Date: Not reported
Cleanup Fund Id : Not reported
Discover Date : 12/19/1987
Enforcement Dt : Not reported
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date : 02/17/1988
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Lat/Lon : 33.8060799 / -117.8987256
Leak Cause: Not reported
Leak Source: Not reported
Beneficial: Not reported
MTBE Date : 1/17/02
MTBE Tested : YES
Max MTBE GW : 605000
GW Qualifies : =
Max MTBE Soil : Not reported
Soil Qualifies : Not reported
Hydr Basin #: UNNAMED BASIN
Operator : BISBEE, ROBERT J.
Oversight Prgm : LOP
Priority : Not reported
Work Suspended : Not reported
Responsible Party: H SEYMOUR BEEK
Well name: LPA REPORTED PRIMARY SOURCE
Distance From Lust: 12897.0070754212218189492076
Waste Disch Global Id: W0608900228
MTBE Class: B
Waste Disch Assigned Name: 4500228-001GEN
Case Type: Other Ground Water not used for drinking or no beneficial use
Global ID: T0605900591
How Stopped Date: / /
Organization Name: Not reported
Contact Person: Not reported
RP Address: 410 S BAYFRONT

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s)
EDR ID Number
EPA ID Number

BISBEES MARINE FUELS INC. (Continued)

U001577463

MTBE Concentration: 2
MTBE Fuel: 1
Case Number: 083000748T
Water System Name: OUTPOST, THE
Code Name: ORANGE
Agency Name: Not reported
Priority: 2A
State Explanaton: SITE WORKPLAN UNDERWAY
Substance: GASOLINE
Staff: NANCY OLSON MARTIN
Case Type: O
Summary: Not reported

UST HIST:

Facility ID: 33145
Tank Num: 1
Tank Capacity: 7000
Type of Fuel: DIESEL
Leak Detection: Visual, Stock Inventor
Contact Name: ROBERT J. BISBEE, PRESIDENT
Total Tanks: 4
Facility Type: Gas Station

Tank Used for: PRODUCT
Container Num: 1
Year Installed: 1956
Tank Construction: 3/8" unknown

Telephone: (714) 673-7686
Region: STATE
Other Type: MARINE FUEL DOCK

Facility ID: 33145
Tank Num: 2
Tank Capacity: 4000
Type of Fuel: REGULAR
Leak Detection: Visual, Stock Inventor
Contact Name: ROBERT J. BISBEE, PRESIDENT
Total Tanks: 4
Facility Type: Gas Station

Tank Used for: PRODUCT
Container Num: 2
Year Installed: 1956
Tank Construction: 3/8" inches

Telephone: (714) 673-7686
Region: STATE
Other Type: MARINE FUEL DOCK

Facility ID: 33145
Tank Num: 3
Tank Capacity: 5000
Type of Fuel: DIESEL
Leak Detection: Visual, Stock Inventor
Contact Name: ROBERT J. BISBEE, PRESIDENT
Total Tanks: 4
Facility Type: Gas Station

Tank Used for: PRODUCT
Container Num: 3
Year Installed: 1956
Tank Construction: 3/8" inches

Telephone: (714) 673-7686
Region: STATE
Other Type: MARINE FUEL DOCK

Facility ID: 33145
Tank Num: 4
Tank Capacity: 500
Type of Fuel: WASTE OIL
Leak Detection: Visual, Stock Inventor
Contact Name: ROBERT J. BISBEE, PRESIDENT
Total Tanks: 4
Facility Type: Gas Station

Tank Used for: WASTE
Container Num: 4
Year Installed: 1956
Tank Construction: 3/8" inches

Telephone: (714) 673-7686
Region: STATE
Other Type: MARINE FUEL DOCK

MAP FINDINGS

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

Database(s) EDR ID Number
 EPA ID Number

F24
SW **504 S BAYFRONT**
1/4-1/2 **NEWPORT BEACH, CA 0**
2379 ft.

CHMIRS **S105656030**
 N/A

Site 3 of 3 in cluster F

Relative:
Lower

CHMIRS:

Actual:
5 ft.

OES Control Number:	98-2495
Chemical Name:	Gasoline
Extent of Release:	Not reported
Property Use:	Not reported
Incident Date:	Not reported
Date Completed:	Not reported
Time Completed :	Not reported
Agency Id Number :	Not reported
Agency Incident Number :	Not reported
OES Incident Number :	98-2495
Time Notified :	Not reported
Surrounding Area :	Not reported
Estimated Temperature :	Not reported
Property Management :	Not reported
More Than Two Substances Involved? :	Not reported
Special Studies 1 :	Not reported
Special Studies 2 :	Not reported
Special Studies 3 :	Not reported
Special Studies 4 :	Not reported
Special Studies 5 :	Not reported
Special Studies 6 :	Not reported
Responding Agency Personnel # Of Injuries :	0
Responding Agency Personnel # Of Fatalities :	0
Resp Agency Personnel # Of Decontaminated :	Not reported
Others Number Of Decontaminated :	Not reported
Others Number Of Injuries :	Not reported
Others Number Of Fatalities :	Not reported
Vehicle Make/year :	Not reported
Vehicle License Number :	Not reported
Vehicle State :	Not reported
Vehicle Id Number :	Not reported
CA/DOT/PUC/ICC Number :	Not reported
Company Name :	Not reported
Reporting Officer Name/ID :	Not reported
Report Date :	Not reported
Comments :	Not reported
Facility Telephone Number :	Not reported
Waterway Involved :	Yes
Waterway :	Newport Harbor
Spill Site :	Ship/Harbor/Port
Cleanup By :	Responsible Party
Containment :	Yes
What Happened :	30' power boat sank. Spill has been boomed
Type :	PETROLEUM, PETROLEUM
Other :	Not reported
Chemical 1 :	Motor oil
Quantity Released :	1 Gal(s)
Chemical 2 :	Not Reported
Chemical 3 :	Not Reported
Date/Time :	5/29/98
Evacuations :	0

MAP FINDINGS

Map ID
 Direction
 Distance
 Distance (ft.)
 Elevation Site

Database(s)
 EDR ID Number
 EPA ID Number

(Continued)

S105656030

25
 NW
 1/4-1/2
 2425 ft.

NEWPORT BEACH CARS L L C
455 E PACIFIC COAST HWY
NEWPORT BEACH, CA 92660

RCRIS-SQG 1000364521
FINDS CAD981967508
HAZNET
LUST
HIST UST

Relative:
 Higher

RCRIS:
 Owner: NEWPORT BEACH CARS L L C
 (949) 673-0900
 EPA ID: CAD981967508
 Contact: BILL SCHINDELE
 (949) 673-0900

Actual:
 17 ft.

Classification: Small Quantity Generator
 TSDF Activities: Not reported
 Violation Status: No violations found

FINDS:

Other Pertinent Environmental Activity Identified at Site:
 Facility Registry System (FRS)
 Resource Conservation and Recovery Act Information system (RCRAINFO)

State LUST:

Cross Street: Not reported
 Qty Leaked: Not reported
 Case Number: Not reported
 Reg Board: 8
 Chemical: 1203512034
 Lead Agency: Local Agency
 Local Agency: 0
 Case Type: Soil only
 Status: Case Closed
 Review Date: Not reported
 Workplan: 12/18/90
 Pollution Char: Not reported
 Remed Action: Not reported
 Monitoring: Not reported
 Close Date: 04/23/1992
 Release Date: Not reported
 Cleanup Fund Id: Not reported
 Discover Date: / /
 Enforcement Dt: Not reported
 Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
 Enter Date: / /
 Funding: Not reported
 Staff Initials: JK
 How Discovered: Not reported
 How Stopped: Not reported
 Interim: Not reported
 Leak Cause: Not reported
 Leak Source: Not reported
 MTBE Date: / /
 Max MTBE GW: 0 Parts per Billion
 MTBE Tested: Not Required to be Tested.
 Priority: Not reported
 Local Case #: 91UT006
 Beneficial: Not reported

Confirm Leak: Not reported
 Prelim Assess: 12/18/90
 Remed Plan: Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s)
EDR ID Number
EPA ID Number

NEWPORT BEACH CARS L L C (Continued)

1000364521

Staff : NOM
GW Qualifier : Not reported
Max MTBE Soil : Not reported
Soil Qualifier : Not reported
Hydr Basin # : Not reported
Operator : Not reported
Oversight Prgm: Local Oversight Program UST
Oversight Prgm : LOP
Review Date : Not reported
Stop Date : / /
Work Suspended : Not reported
Responsible Party: JOE TAYLOR
RP Address: 445 E COAST HWY
Global Id: T0605974055
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 0
Mtbe Fuel: 0
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported

LUST Region 8:

Region: 8
Substance: 12035,12034
Regional Board: 08
Local Case Num: 91UT006
Facility Status: Case Closed
Staff: NANCY OLSON MARTIN
Lead Agency: Local Agency
Local Agency: 30000L
Qty Leaked: Not reported
County: Orange
Review Date: Not reported
Workplan: 12/18/90
Pollution Char: Not reported
Remed Action: Not reported
Close Date: 04/23/1992
Cleanup Fund Id : Not reported
Discover Date : Not reported
Enforcement Dt : Not reported
Ent Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date : / /
Funding: Not reported
Staff Initials: JK
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Lat/Lon : Not reported
Leak Cause: Not reported
Leak Source: Not reported
Beneficial: Not reported
MTBE Date : Not reported
MTBE Tested : NRQ
Max MTBE GW : Not reported
GW Qualifies : Not reported

Cross Street: Not reported

Confirm Leak: Not reported
Prelim Assess: 12/18/90
Remed Plan: Not reported
Monitoring: Not reported

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

NEWPORT BEACH CARS L L C (Continued)

1000364521

Max MTBE Soil : Not reported
Soil Qualifies : Not reported
Hydr Basin #: Not reported
Operator : Not reported
Oversight Prgm : LOP
Priority : Not reported
Work Suspended :Not reported
Responsible Party:JOE TAYLOR
Well name: Not reported
Distance From Lust: Not reported
Waste Disch Global Id: Not reported
MTBE Class: *
Waste Disch Assigned Name: Not reported
Case Type: Soil only
Global ID: T0605974055
How Stopped Date: / /
Organization Name: Not reported
Contact Person: Not reported
RP Address: 445 E COAST HWY
MTBE Concentration: 0
MTBE Fuel: 0
Case Number: Not reported
Water System Name: Not reported
Code Name: ORANGE
Agency Name: Not reported
Priority: Not reported
State Explanaton: CASE CLOSED
Substance: Not reported
Staff: NANCY OLSON MARTIN
Case Type: S
Summary: Not reported

LUST Region OR:

Facility Id: 91UT006
Site Number: RO0002423
Region: ORANGE
Case Type: Soil only
Chemical: Diesel
Date Closed: 04/23/1992
Current Status: 9
Facility Status: 02

Facility Id: 91UT006
Site Number: RO0002423
Region: ORANGE
Case Type: Soil only
Chemical: Waste Oil
Date Closed: 04/23/1992
Current Status: 9
Facility Status: 02

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

EDR ID Number
EPA ID Number
Database(s)

NEWPORT BEACH CARS L L C (Continued)

1000364521

Facility Id: 93UT087
Site Number: RO0003015
Region: ORANGE
Case Type: Other ground water affected
Chemical: Gasoline
Date Closed: Not reported
Current Status: 7
Facility Status: 01

HAZNET:

Gepaid: CAD981967508
TSD EPA ID: CAD093459485
Gen County: Orange
Tsd County: Fresno
Tons: .0664
Waste Category: Unspecified solvent mixture Waste
Disposal Method: Transfer Station
Contact: REPUBLIC INDUSTRIES INC.
Telephone: (954) 713-5200
Mailing Address: 445 E COAST HWY
NEWPORT BEACH, CA 92660 - 6133
County Orange

Gepaid: CAD981967508
TSD EPA ID: CAT080013352
Gen County: Orange
Tsd County: Los Angeles
Tons: 4.1282
Waste Category: Aqueous solution with 10% or more total organic residues
Disposal Method: Recycler
Contact: REPUBLIC INDUSTRIES INC.
Telephone: (954) 713-5200
Mailing Address: 445 E COAST HWY
NEWPORT BEACH, CA 92660 - 6133
County Orange

Gepaid: CAD981967508
TSD EPA ID: CAT080013352
Gen County: Orange
Tsd County: Los Angeles
Tons: 1.4595
Waste Category: Oil/water separation sludge
Disposal Method: Recycler
Contact: REPUBLIC INDUSTRIES INC.
Telephone: (954) 713-5200
Mailing Address: 445 E COAST HWY
NEWPORT BEACH, CA 92660 - 6133
County Orange

Gepaid: CAD981967508
TSD EPA ID: CAT000613893
Gen County: Orange
Tsd County: Los Angeles
Tons: .3919
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Contact: REPUBLIC INDUSTRIES INC.
Telephone: (954) 713-5200

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

EDR ID Number
EPA ID Number
Database(s)

NEWPORT BEACH CARS L L C (Continued)

1000364521

Mailing Address: 445 E COAST HWY
NEWPORT BEACH, CA 92660 - 6133
County Orange
Gepaid: CAD981967508
TSD EPA ID: CAD099452708
Gen County: Orange
Tsd County: Los Angeles
Tons: .6588
Waste Category: Oil/water separation sludge
Disposal Method: Transfer Station
Contact: REPUBLIC INDUSTRIES INC.
Telephone: (954) 713-5200
Mailing Address: 445 E COAST HWY
NEWPORT BEACH, CA 92660 - 6133
County Orange

The CA HAZNET database contains 23 additional records for this site.
Please click here or contact your EDR Account Executive for more information.

UST HIST:

Facility ID:	15861	Tank Used for:	PRODUCT
Tank Num:	1	Container Num:	6
Tank Capacity:	2000	Year Installed:	1968
Type of Fuel:	PREMIUM	Tank Construction:	Not reported
Leak Detection:	None		
Contact Name:	J. MALDONADO	Telephone:	(714) 673-0900
Total Tanks:	8	Region:	STATE
Facility Type:	Other	Other Type:	NEW CAR DEALER
Facility ID:	15861	Tank Used for:	PRODUCT
Tank Num:	2	Container Num:	7
Tank Capacity:	10000	Year Installed:	1975
Type of Fuel:	UNLEADED	Tank Construction:	Not reported
Leak Detection:	None		
Contact Name:	J. MALDONADO	Telephone:	(714) 673-0900
Total Tanks:	8	Region:	STATE
Facility Type:	Other	Other Type:	NEW CAR DEALER
Facility ID:	15861	Tank Used for:	WASTE
Tank Num:	3	Container Num:	1
Tank Capacity:	1000	Year Installed:	1968
Type of Fuel:	WASTE OIL	Tank Construction:	Not reported
Leak Detection:	None		
Contact Name:	J. MALDONADO	Telephone:	(714) 673-0900
Total Tanks:	8	Region:	STATE
Facility Type:	Other	Other Type:	NEW CAR DEALER
Facility ID:	15861	Tank Used for:	PRODUCT
Tank Num:	4	Container Num:	2
Tank Capacity:	1000	Year Installed:	1968
Type of Fuel:	Not Reported	Tank Construction:	Not reported
Leak Detection:	None		
Contact Name:	J. MALDONADO	Telephone:	(714) 673-0900
Total Tanks:	8	Region:	STATE
Facility Type:	Other	Other Type:	NEW CAR DEALER
Facility ID:	15861	Tank Used for:	WASTE

Map ID
Direction
Distance
Distance (ft.)
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number
EPA ID Number

NEWPORT BEACH CARS L L C (Continued)

1000364521

Tank Num: 5
Tank Capacity: 250
Type of Fuel: Not Reported
Leak Detection: None
Contact Name: J. MALDONADO
Total Tanks: 8
Facility Type: Other

Container Num: 3
Year Installed: 1968
Tank Construction: 8 inches
Telephone: (714) 673-0900
Region: STATE
Other Type: NEW CAR DEALER

Facility ID: 15861
Tank Num: 6
Tank Capacity: 250
Type of Fuel: Not Reported
Leak Detection: None
Contact Name: J. MALDONADO
Total Tanks: 8
Facility Type: Other

Tank Used for: WASTE
Container Num: 4
Year Installed: 1968
Tank Construction: 8 inches
Telephone: (714) 673-0900
Region: STATE
Other Type: NEW CAR DEALER

Facility ID: 15861
Tank Num: 7
Tank Capacity: 1000
Type of Fuel: Not Reported
Leak Detection: None
Contact Name: J. MALDONADO
Total Tanks: 8
Facility Type: Other

Tank Used for: PRODUCT
Container Num: 5
Year Installed: 1968
Tank Construction: Not reported
Telephone: (714) 673-0900
Region: STATE
Other Type: NEW CAR DEALER

Facility ID: 15861
Tank Num: 8
Tank Capacity: 1000
Type of Fuel: Not Reported
Leak Detection: Stock Inventor
Contact Name: J. MALDONADO
Total Tanks: 8
Facility Type: Other

Tank Used for: PRODUCT
Container Num: 8
Year Installed: 1968
Tank Construction: Not reported
Telephone: (714) 673-0900
Region: STATE
Other Type: NEW CAR DEALER

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
CORONA DEL MAR	S101299878	UNOCAL #4898	3928 COAST HWY E	92625	LUST
CORONA DEL MAR	S103444518	UNITED OIL COMPANY	3400 COAST HWY E	92625	LUST
CORONA DEL MAR	S105695949	SHELL OIL	2801 COAST	92625	LUST
CORONA DEL MAR	S105695950	SHELL OIL	3600 COAST	92625	LUST
CORONA DEL MAR	S105695951	ARCO SS# 1030	3636 COAST	92625	LUST
CORONA DEL MAR	S105960681	FORMER SHELL SERVICE STATION	3600 COAST HWY N	92625	LUST
CORONA DEL MAR	1000107758	DRY CLEANERS	3536 E PACIFIC COAST HWY	92625	RCRIS-SQG, FINDS
CORONA DEL MAR	1000597231	RITZ CLEANERS	3536 E PACIFIC COAST HWY	92625	RCRIS-SQG, FINDS, HAZNET, CLEANERS
CORONA DEL MAR	1000856914	BERGSTROM FAMILY CLEANERS	2934 E PACIFIC COAST HWY	92625	RCRIS-SQG, FINDS, HAZNET, CLEANERS
CORONA DEL MAR	S100571212	UNOCAL SERVICE STATION #3797	2201 E PACIFIC COAST HWY	92625	HAZNET
CORONA DEL MAR	S102815364	FOX PHOTO INC	3617 PACIFIC COAST HWY	92625	HAZNET
CORONA DEL MAR	S102826528	RAPID GAS #32	3400 E PACIFIC COAST HWY	92625	HAZNET
CORONA DEL MAR	S103652059	SANDERSON J RAY CORP	3141 PACIFIC COAST HWY	92625	HAZNET
CORONA DEL MAR	S103963153	EQUILON ENTERPRISES LLC	3600 E PACIFIC COAST HWY	92625	HAZNET
CORONA DEL MAR	U001576769	STATION #3797	2201 E. PACIFIC COAST HWY.	92625	HIST UST
CORONA DEL MAR	U001576771	UNION OIL SERVICE STATION #379	2201 E PACIFIC COAST HIGHWAY	92625	HIST UST
LONG BEACH	S105087507	SOUTHERN CALIFORNIA EDISON	1065 N HARBOR SCENIC DRIVE QAD	92660	HAZNET
NEWPORT BEACH	S105247948	NEWPORT TERRACE LF	WEST 19TH ST. DEAD END		SWF/LF
NEWPORT BEACH	S103444588	MOBIL S S #18-HG7	1500 BALBOA	92662	LUST
NEWPORT BEACH	S105696164	BAXTER'S RESTAURANT	333 BAYSIDE	92660	LUST
NEWPORT BEACH	S103866910	MOBIL S S #18-HND	1000 COAST	92625	LUST
NEWPORT BEACH	S105696166	SHELL OIL	2800 COAST	92660	LUST
NEWPORT BEACH	U003783046	MOBIL #18-HND	1000 E COAST HWY # 18-HND	92660	UST
NEWPORT BEACH	1000474495	LORAL AEROSPACE AERONUTRONIC	FORD RD	92660	PADS, FINDS, RCRIS-LQG, RCRIS-TSD, CORRACTS, CERC-NFF
NEWPORT BEACH	1005415593	NEWPORT FAB L L C	4311 JAMBOREE RD BLDG 503	92660	FINDS, RCRIS-LQG
NEWPORT BEACH	U001575481	TEXACO	1600 JAMBOREE / SAN JOAQUIN	92660	HIST UST
NEWPORT BEACH	U003913437	JAZZ SEMICONDUCTOR INC	4321 JAMBOREE RD STE 503	92660	UST
NEWPORT BEACH	U003913441	NEWPORT CORPORATE TOWER	4100 NEWPORT PL STE 250	92660	UST
NEWPORT BEACH	U002096233	NEWPORT PLACE	4100 NEWPORT PL	92660	CA FID UST
NEWPORT BEACH	S103679491	HOLLIS AND ASSOCIATES	ON NEWPORT CENTER DR @ PACIFIC	92660	HAZNET
NEWPORT BEACH	S105964593	COYOTE CANYON SANITARY LANDFILL	20661 NEWPORT COAST DRIVE		SWF/LF
NEWPORT BEACH	1005904280	SHELL SERVICE STATION	911 PACIFIC COAST HWY	92660	RCRIS-SQG, FINDS
NEWPORT BEACH	S100723386	NEWPORT BANNING RANCH	PCH / SANTA ANA RIVER		Orange Co. Industrial Site
NEWPORT BEACH	S103627994	NEWPORT PRINTERS	131 SAN JOAQUIN HILLS ROAD	92660	HAZNET

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List

Source: EPA
Telephone: N/A

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/22/03
Date Made Active at EDR: 08/26/03
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 08/04/03
Elapsed ASTM days: 22
Date of Last EDR Contact: 08/04/03

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 8
Telephone: 303-312-6774

EPA Region 4
Telephone 404-562-8033

Proposed NPL: Proposed National Priority List Sites

Source: EPA
Telephone: N/A

Date of Government Version: 06/10/03
Date Made Active at EDR: 08/26/03
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 08/04/03
Elapsed ASTM days: 22
Date of Last EDR Contact: 08/04/03

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

Source: EPA
Telephone: 703-413-0223

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 06/16/03
Date Made Active at EDR: 08/01/03
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/03
Elapsed ASTM days: 39
Date of Last EDR Contact: 09/24/03

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Source: EPA
Telephone: 703-413-0223

As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/11/03
Date Made Active at EDR: 08/01/03
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 06/23/03
Elapsed ASTM days: 39
Date of Last EDR Contact: 09/24/03

CORRACTS: Corrective Action Report

Source: EPA

Telephone: 800-424-9346

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 08/13/03
Date Made Active at EDR: 09/18/03
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 08/22/03
Elapsed ASTM days: 27
Date of Last EDR Contact: 09/08/03

RCRIS: Resource Conservation and Recovery Information System

Source: EPA

Telephone: 800-424-9346

Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/10/03
Date Made Active at EDR: 10/01/03
Database Release Frequency: Varies

Date of Data Arrival at EDR: 09/11/03
Elapsed ASTM days: 20
Date of Last EDR Contact: 09/11/03

ERNS: Emergency Response Notification System

Source: National Response Center, United States Coast Guard

Telephone: 202-260-2342

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/02
Date Made Active at EDR: 02/03/03
Database Release Frequency: Annually

Date of Data Arrival at EDR: 01/27/03
Elapsed ASTM days: 7
Date of Last EDR Contact: 10/27/03

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System

Source: EPA/NTIS

Telephone: 800-424-9346

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/01/01
Database Release Frequency: Biennially

Date of Last EDR Contact: 10/01/03
Date of Next Scheduled EDR Contact: 12/15/03

CONSENT: Superfund (CERCLA) Consent Decrees

Source: EPA Regional Offices

Telephone: Varies

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ROD: Records Of Decision

Source: EPA

Telephone: 703-416-0223

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/09/03

Database Release Frequency: Annually

Date of Last EDR Contact: 10/08/03

Date of Next Scheduled EDR Contact: 01/05/04

DELISTED NPL: National Priority List Deletions

Source: EPA

Telephone: N/A

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/22/03

Database Release Frequency: Quarterly

Date of Last EDR Contact: 08/04/03

Date of Next Scheduled EDR Contact: 11/03/03

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report

Source: EPA

Telephone: N/A

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/25/03

Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/07/03

Date of Next Scheduled EDR Contact: 01/05/04

HMIRS: Hazardous Materials Information Reporting System

Source: U.S. Department of Transportation

Telephone: 202-366-4555

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/31/03

Database Release Frequency: Annually

Date of Last EDR Contact: 10/23/03

Date of Next Scheduled EDR Contact: 01/19/04

MLTS: Material Licensing Tracking System

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/16/03

Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/07/03

Date of Next Scheduled EDR Contact: 01/05/04

MINES: Mines Master Index File

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959

Date of Government Version: 06/07/03

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/01/03

Date of Next Scheduled EDR Contact: 12/29/03

NPL LIENS: Federal Superfund Liens

Source: EPA

Telephone: 202-564-4267

Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 08/25/03
Date of Next Scheduled EDR Contact: 11/24/03

PADS: PCB Activity Database System

Source: EPA
Telephone: 202-564-3887

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/30/03
Database Release Frequency: Annually

Date of Last EDR Contact: 08/13/03
Date of Next Scheduled EDR Contact: 11/10/03

DOD: Department of Defense Sites

Source: USGS
Telephone: 703-648-5920

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 04/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/15/03
Date of Next Scheduled EDR Contact: 11/10/03

US BROWNFIELDS: A Listing of Brownfields Sites

Source: Environmental Protection Agency
Telephone: 202-566-2777

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 07/15/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 09/15/03
Date of Next Scheduled EDR Contact: 12/15/03

RAATS: RCRA Administrative Action Tracking System

Source: EPA
Telephone: 202-564-4104

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 09/08/03
Date of Next Scheduled EDR Contact: 12/08/03

TRIS: Toxic Chemical Release Inventory System

Source: EPA
Telephone: 202-260-1531

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 09/23/03
Date of Next Scheduled EDR Contact: 12/22/03

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TSCA: Toxic Substances Control Act

Source: EPA

Telephone: 202-260-5521

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/98

Database Release Frequency: Every 4 Years

Date of Last EDR Contact: 09/02/03

Date of Next Scheduled EDR Contact: 12/08/03

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA

Telephone: 202-564-2501

Date of Government Version: 08/21/03

Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/23/03

Date of Next Scheduled EDR Contact: 12/22/03

SSTS: Section 7 Tracking Systems

Source: EPA

Telephone: 202-564-5008

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/01

Database Release Frequency: Annually

Date of Last EDR Contact: 10/20/03

Date of Next Scheduled EDR Contact: 01/19/04

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Source: EPA/Office of Prevention, Pesticides and Toxic Substances

Telephone: 202-564-2501

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/21/03

Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/23/03

Date of Next Scheduled EDR Contact: 12/22/03

STATE OF CALIFORNIA ASTM STANDARD RECORDS

AWP: Annual Workplan Sites

Source: California Environmental Protection Agency

Telephone: 916-323-3400

Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 08/31/03

Date Made Active at EDR: 09/17/03

Database Release Frequency: Annually

Date of Data Arrival at EDR: 09/02/03

Elapsed ASTM days: 15

Date of Last EDR Contact: 09/02/03

CAL-SITES: Calsites Database

Source: Department of Toxic Substance Control

Telephone: 916-323-3400

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 08/31/03

Date Made Active at EDR: 09/17/03

Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 09/02/03

Elapsed ASTM days: 15

Date of Last EDR Contact: 09/02/03

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CHMIRS: California Hazardous Material Incident Report System

Source: Office of Emergency Services
Telephone: 916-845-8400

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/02
Date Made Active at EDR: 08/07/03
Database Release Frequency: Varies

Date of Data Arrival at EDR: 07/11/03
Elapsed ASTM days: 27
Date of Last EDR Contact: 08/25/03

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-9100

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 04/01/01
Date Made Active at EDR: 07/26/01
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 05/29/01
Elapsed ASTM days: 58
Date of Last EDR Contact: 10/27/03

NOTIFY 65: Proposition 65 Records

Source: State Water Resources Control Board
Telephone: 916-445-3846

Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/93
Date Made Active at EDR: 11/19/93
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 11/01/93
Elapsed ASTM days: 18
Date of Last EDR Contact: 10/20/03

TOXIC PITS: Toxic Pits Cleanup Act Sites

Source: State Water Resources Control Board
Telephone: 916-227-4364

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/95
Date Made Active at EDR: 09/26/95
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 08/30/95
Elapsed ASTM days: 27
Date of Last EDR Contact: 08/04/03

SWF/LF (SWIS): Solid Waste Information System

Source: Integrated Waste Management Board
Telephone: 916-341-6320

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inventory of solid waste disposal facilities or landfills. These may be active or inactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/12/03
Date Made Active at EDR: 10/16/03
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 09/15/03
Elapsed ASTM days: 31
Date of Last EDR Contact: 09/15/03

WMUDS/SWAT: Waste Management Unit Database

Source: State Water Resources Control Board
Telephone: 916-227-4448

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/01/00
Date Made Active at EDR: 05/10/00
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 04/10/00
Elapsed ASTM days: 30
Date of Last EDR Contact: 09/12/03

LUST: Leaking Underground Storage Tank Information System

Source: State Water Resources Control Board
Telephone: 916-341-5740

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 04/02/03
Date Made Active at EDR: 04/25/03
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 04/16/03
Elapsed ASTM days: 9
Date of Last EDR Contact: 10/14/03

CA BOND EXP. PLAN: Bond Expenditure Plan

Source: Department of Health Services
Telephone: 916-255-2118

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/89
Date Made Active at EDR: 08/02/94
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 07/27/94
Elapsed ASTM days: 6
Date of Last EDR Contact: 05/31/94

CA UST:

UST: Active UST Facilities

Source: SWRCB
Telephone: 916-341-5700
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 04/02/03
Date Made Active at EDR: 04/30/03
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 04/16/03
Elapsed ASTM days: 14
Date of Last EDR Contact: 10/14/03

VCP: Voluntary Cleanup Program Properties

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 08/31/03
Date Made Active at EDR: 09/17/03
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 09/02/03
Elapsed ASTM days: 15
Date of Last EDR Contact: 09/02/03

INDIAN UST: Underground Storage Tanks on Indian Land

Source: EPA Region 9
Telephone: 415-972-3368

Date of Government Version: N/A
Date Made Active at EDR: N/A
Database Release Frequency: Varies

Date of Data Arrival at EDR: N/A
Elapsed ASTM days: 0
Date of Last EDR Contact: N/A

CA FID UST: Facility Inventory Database

Source: California Environmental Protection Agency
Telephone: 916-445-6532

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/31/94
Date Made Active at EDR: 09/29/95
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 09/05/95
Elapsed ASTM days: 24
Date of Last EDR Contact: 12/28/98

HIST UST: Hazardous Substance Storage Container Database

Source: State Water Resources Control Board
Telephone: 916-341-5700

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/90
Date Made Active at EDR: 02/12/91
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 01/25/91
Elapsed ASTM days: 18
Date of Last EDR Contact: 07/26/01

STATE OF CALIFORNIA ASTM SUPPLEMENTAL RECORDS

AST: Aboveground Petroleum Storage Tank Facilities

Source: State Water Resources Control Board
Telephone: 916-341-5712
Registered Aboveground Storage Tanks.

Date of Government Version: 07/01/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 08/04/03
Date of Next Scheduled EDR Contact: 11/03/03

CLEANERS: Cleaner Facilities

Source: Department of Toxic Substance Control
Telephone: 916-225-0873

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 03/11/03
Database Release Frequency: Annually

Date of Last EDR Contact: 10/20/03
Date of Next Scheduled EDR Contact: 01/05/04

CA WDS: Waste Discharge System

Source: State Water Resources Control Board
Telephone: 916-657-1571

Sites which have been issued waste discharge requirements.

Date of Government Version: 09/22/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/24/03
Date of Next Scheduled EDR Contact: 12/22/03

DEED: List of Deed Restrictions

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

The use of recorded land use restrictions is one of the methods the DTSC uses to protect the public from unsafe exposures to hazardous substances and wastes.

Date of Government Version: 10/07/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/08/03
Date of Next Scheduled EDR Contact: 01/05/04

NFA: No Further Action Determination

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

This category contains properties at which DTSC has made a clear determination that the property does not pose a problem to the environment or to public health.

Date of Government Version: 08/31/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/02/03
Date of Next Scheduled EDR Contact: 12/01/03

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EMI: Emissions Inventory Data

Source: California Air Resources Board
Telephone: 916-322-2990

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/01
Database Release Frequency: Varies

Date of Last EDR Contact: 10/20/03
Date of Next Scheduled EDR Contact: 01/19/04

REF: Unconfirmed Properties Referred to Another Agency

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

This category contains properties where contamination has not been confirmed and which were determined as not requiring direct DTSC Site Mitigation Program action or oversight. Accordingly, these sites have been referred to another state or local regulatory agency.

Date of Government Version: 08/31/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/02/03
Date of Next Scheduled EDR Contact: 12/01/03

SCH: School Property Evaluation Program

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 08/31/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/02/03
Date of Next Scheduled EDR Contact: 12/01/03

NFE: Properties Needing Further Evaluation

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

This category contains properties that are suspected of being contaminated. These are unconfirmed contaminated properties that need to be assessed using the PEA process. PEA in Progress indicates properties where DTSC is currently conducting a PEA. PEA Required indicates properties where DTSC has determined a PEA is required, but not currently underway.

Date of Government Version: 08/31/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/02/03
Date of Next Scheduled EDR Contact: 12/01/03

HAZNET: Hazardous Waste Information System

Source: California Environmental Protection Agency
Telephone: 916-255-1136

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 08/12/03
Date of Next Scheduled EDR Contact: 11/10/03

LOCAL RECORDS**ALAMEDA COUNTY:****Local Oversight Program Listing of UGT Cleanup Sites**

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/27/03
Date of Next Scheduled EDR Contact: 01/26/04

Underground Tanks

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 07/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/27/03
Date of Next Scheduled EDR Contact: 01/26/04

CONTRA COSTA COUNTY:

Site List

Source: Contra Costa Health Services Department
Telephone: 925-646-2286

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 09/04/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 09/02/03
Date of Next Scheduled EDR Contact: 12/01/03

FRESNO COUNTY:

CUPA Resources List

Source: Dept. of Community Health
Telephone: 559-445-3271

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 10/07/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/21/03
Date of Next Scheduled EDR Contact: 11/10/03

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Kern County Sites and Tanks Listing.

Date of Government Version: 07/25/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/08/03
Date of Next Scheduled EDR Contact: 12/08/03

LOS ANGELES COUNTY:

List of Solid Waste Facilities

Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 06/03/03
Database Release Frequency: Varies

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

City of El Segundo Underground Storage Tank

Source: City of El Segundo Fire Department
Telephone: 310-524-2236

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/11/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

City of Long Beach Underground Storage Tank

Source: City of Long Beach Fire Department
Telephone: 562-570-2543

Date of Government Version: 05/30/02
Database Release Frequency: Annually

Date of Last EDR Contact: 08/29/03
Date of Next Scheduled EDR Contact: 11/24/03

City of Torrance Underground Storage Tank

Source: City of Torrance Fire Department
Telephone: 310-618-2973

Date of Government Version: 09/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

City of Los Angeles Landfills

Source: Engineering & Construction Division
Telephone: 213-473-7869

Date of Government Version: 03/01/02
Database Release Frequency: Varies

Date of Last EDR Contact: 09/15/03
Date of Next Scheduled EDR Contact: 12/15/03

HMS: Street Number List

Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 04/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

Site Mitigation List

Source: Community Health Services
Telephone: 323-890-7806
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/07/03
Database Release Frequency: Annually

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

San Gabriel Valley Areas of Concern

Source: EPA Region 9
Telephone: 415-972-3178
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/98
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 07/06/99
Date of Next Scheduled EDR Contact: N/A

MARIN COUNTY:

Underground Storage Tank Sites

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Currently permitted USTs in Marin County.

Date of Government Version: 08/19/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/04/03
Date of Next Scheduled EDR Contact: 11/03/03

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NAPA COUNTY:

Sites With Reported Contamination

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 10/02/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 09/30/03
Date of Next Scheduled EDR Contact: 12/29/03

Closed and Operating Underground Storage Tank Sites

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 10/02/03
Database Release Frequency: Annually

Date of Last EDR Contact: 09/30/03
Date of Next Scheduled EDR Contact: 12/29/03

ORANGE COUNTY:

List of Underground Storage Tank Cleanups

Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 07/01/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/11/03
Date of Next Scheduled EDR Contact: 12/08/03

List of Underground Storage Tank Facilities

Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 07/01/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/11/03
Date of Next Scheduled EDR Contact: 12/08/03

List of Industrial Site Cleanups

Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 10/24/00
Database Release Frequency: Annually

Date of Last EDR Contact: 09/11/03
Date of Next Scheduled EDR Contact: 12/08/03

PLACER COUNTY:

Master List of Facilities

Source: Placer County Health and Human Services
Telephone: 530-889-7312
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 07/17/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 09/23/03
Date of Next Scheduled EDR Contact: 12/22/03

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites

Source: Department of Public Health
Telephone: 909-358-5055
Riverside County Underground Storage Tank Cleanup Sites (LUST).

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/03/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/20/03
Date of Next Scheduled EDR Contact: 01/19/04

Underground Storage Tank Tank List

Source: Health Services Agency
Telephone: 909-358-5055

Date of Government Version: 05/30/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/20/03
Date of Next Scheduled EDR Contact: 01/19/04

SACRAMENTO COUNTY:

CS - Contaminated Sites

Source: Sacramento County Environmental Management
Telephone: 916-875-8406

Date of Government Version: 07/17/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 08/04/03
Date of Next Scheduled EDR Contact: 11/03/03

ML - Regulatory Compliance Master List

Source: Sacramento County Environmental Management
Telephone: 916-875-8406

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 07/17/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 08/04/03
Date of Next Scheduled EDR Contact: 11/03/03

SAN BERNARDINO COUNTY:

Hazardous Material Permits

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 09/30/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/09/03
Date of Next Scheduled EDR Contact: 12/08/03

SAN DIEGO COUNTY:

Solid Waste Facilities

Source: Department of Health Services
Telephone: 619-338-2209
San Diego County Solid Waste Facilities.

Date of Government Version: 08/01/00
Database Release Frequency: Varies

Date of Last EDR Contact: 08/25/03
Date of Next Scheduled EDR Contact: 11/24/03

Hazardous Materials Management Division Database

Source: Hazardous Materials Management Division
Telephone: 619-338-2268

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/31/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/07/03
Date of Next Scheduled EDR Contact: 01/05/04

SAN FRANCISCO COUNTY:

Local Oversight Facilities

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 09/11/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/08/03
Date of Next Scheduled EDR Contact: 12/08/03

Underground Storage Tank Information

Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 09/11/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/08/03
Date of Next Scheduled EDR Contact: 12/08/03

SAN MATEO COUNTY:

Fuel Leak List

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 07/21/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/27/03
Date of Next Scheduled EDR Contact: 01/26/04

Business Inventory

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 06/16/03
Database Release Frequency: Annually

Date of Last EDR Contact: 10/13/03
Date of Next Scheduled EDR Contact: 01/12/04

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report

Source: Santa Clara Valley Water District
Telephone: 408-265-2600

Date of Government Version: 07/02/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 09/30/03
Date of Next Scheduled EDR Contact: 12/29/03

Hazardous Material Facilities

Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 12/11/02
Database Release Frequency: Annually

Date of Last EDR Contact: 09/08/03
Date of Next Scheduled EDR Contact: 12/08/03

SOLANO COUNTY:

Leaking Underground Storage Tanks

Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/21/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/15/03
Date of Next Scheduled EDR Contact: 12/15/03

Underground Storage Tanks

Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 08/21/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/15/03
Date of Next Scheduled EDR Contact: 12/15/03

SONOMA COUNTY:

Leaking Underground Storage Tank Sites

Source: Department of Health Services
Telephone: 707-565-6565

Date of Government Version: 07/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/27/03
Date of Next Scheduled EDR Contact: 01/26/04

SUTTER COUNTY:

Underground Storage Tanks

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500

Date of Government Version: 07/01/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/27/03
Date of Next Scheduled EDR Contact: 01/05/04

VENTURA COUNTY:

Inventory of Illegal Abandoned and Inactive Sites

Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 09/01/02
Database Release Frequency: Annually

Date of Last EDR Contact: 08/26/03
Date of Next Scheduled EDR Contact: 11/24/03

Listing of Underground Tank Cleanup Sites

Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 09/26/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/15/03
Date of Next Scheduled EDR Contact: 12/15/03

Underground Tank Closed Sites List

Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 07/30/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/16/03
Date of Next Scheduled EDR Contact: 01/12/04

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/02/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/15/03
Date of Next Scheduled EDR Contact: 12/15/03

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Source: Yolo County Department of Health
Telephone: 530-666-8646

Date of Government Version: 06/19/03
Database Release Frequency: Annually

Date of Last EDR Contact: 10/20/03
Date of Next Scheduled EDR Contact: 01/19/04

California Regional Water Quality Control Board (RWQCB) LUST Records

LUST REG 1: Active Toxic Site Investigation

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/01
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 08/25/03
Date of Next Scheduled EDR Contact: 11/24/03

LUST REG 2: Fuel Leak List

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457

Date of Government Version: 03/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/14/03
Date of Next Scheduled EDR Contact: 01/12/04

LUST REG 3: Leaking Underground Storage Tank Database

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147

Date of Government Version: 05/19/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

LUST REG 4: Underground Storage Tank Leak List

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-266-6600

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 08/09/01
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 09/30/03
Date of Next Scheduled EDR Contact: 12/29/03

LUST REG 5: Leaking Underground Storage Tank Database

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-255-3125

Date of Government Version: 07/01/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/16/03
Date of Next Scheduled EDR Contact: 01/05/04

LUST REG 6L: Leaking Underground Storage Tank Case Listing

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424

For more current information, please refer to the State Water Resources Control Board's LUST database.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/09/03
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 09/08/03
Date of Next Scheduled EDR Contact: 12/08/03

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491

Date of Government Version: 05/29/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/07/03
Date of Next Scheduled EDR Contact: 01/05/04

LUST REG 7: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491

Date of Government Version: 07/02/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 09/30/03
Date of Next Scheduled EDR Contact: 12/29/03

LUST REG 8: Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4498
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/16/03
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 08/11/03
Date of Next Scheduled EDR Contact: 11/10/03

LUST REG 9: Leaking Underground Storage Tank Report
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/01
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 10/20/03
Date of Next Scheduled EDR Contact: 01/19/04

California Regional Water Quality Control Board (RWQCB) SLIC Records

SLIC REG 1: Active Toxic Site Investigations
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220

Date of Government Version: 04/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/25/03
Date of Next Scheduled EDR Contact: 11/24/03

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 03/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/14/03
Date of Next Scheduled EDR Contact: 01/12/04

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 09/16/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 08/18/03
Date of Next Scheduled EDR Contact: 11/17/03

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Source: Region Water Quality Control Board Los Angeles Region (4)

Telephone: 213-576-6600

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 07/01/03

Database Release Frequency: Quarterly

Date of Last EDR Contact: 10/27/03

Date of Next Scheduled EDR Contact: 01/26/04

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Source: Regional Water Quality Control Board Central Valley Region (5)

Telephone: 916-855-3075

Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 07/02/03

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/07/03

Date of Next Scheduled EDR Contact: 01/05/04

SLIC REG 6L: SLIC Sites

Source: California Regional Water Quality Control Board, Lahontan Region

Telephone: 530-542-5574

Date of Government Version: 09/09/03

Database Release Frequency: Varies

Date of Last EDR Contact: 09/08/03

Date of Next Scheduled EDR Contact: 12/08/03

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Source: Regional Water Quality Control Board, Victorville Branch

Telephone: 619-241-6583

Date of Government Version: 05/08/03

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/07/03

Date of Next Scheduled EDR Contact: 01/05/04

SLIC REG 7: SLIC List

Source: California Regional Quality Control Board, Colorado River Basin Region

Telephone: 760-346-7491

Date of Government Version: 05/29/03

Database Release Frequency: Varies

Date of Last EDR Contact: 09/08/03

Date of Next Scheduled EDR Contact: 11/24/03

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Source: California Region Water Quality Control Board Santa Ana Region (8)

Telephone: 909-782-3298

Date of Government Version: 04/01/03

Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 10/20/03

Date of Next Scheduled EDR Contact: 01/05/04

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Source: California Regional Water Quality Control Board San Diego Region (9)

Telephone: 858-467-2980

Date of Government Version: 09/08/03

Database Release Frequency: Annually

Date of Last EDR Contact: 09/02/03

Date of Next Scheduled EDR Contact: 12/01/03

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

BROWNFIELDS DATABASES

VCP: Voluntary Cleanup Program Properties

Source: Department of Toxic Substances Control
Telephone: 916-323-3400

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 08/31/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 09/02/03
Date of Next Scheduled EDR Contact: 12/01/03

US BROWNFIELDS: A Listing of Brownfields Sites

Source: Environmental Protection Agency
Telephone: 202-566-2777

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become BCRLF cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: N/A
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: PennWell Corporation
Telephone: (800) 823-6277

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities

Source: Department of Social Services

Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

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GEOCHECK® - PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

NEWPORT MARINA APARTMENTS
919 BAYSIDE DR
NEWPORT BEACH, CA 92660

TARGET PROPERTY COORDINATES

Latitude (North): 33.610500 - 33° 36' 37.8"
Longitude (West): 117.892799 - 117° 53' 34.1"
Universal Transverse Mercator: Zone 11
UTM X (Meters): 417174.3
UTM Y (Meters): 3719134.5
Elevation: 16 ft. above sea level

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

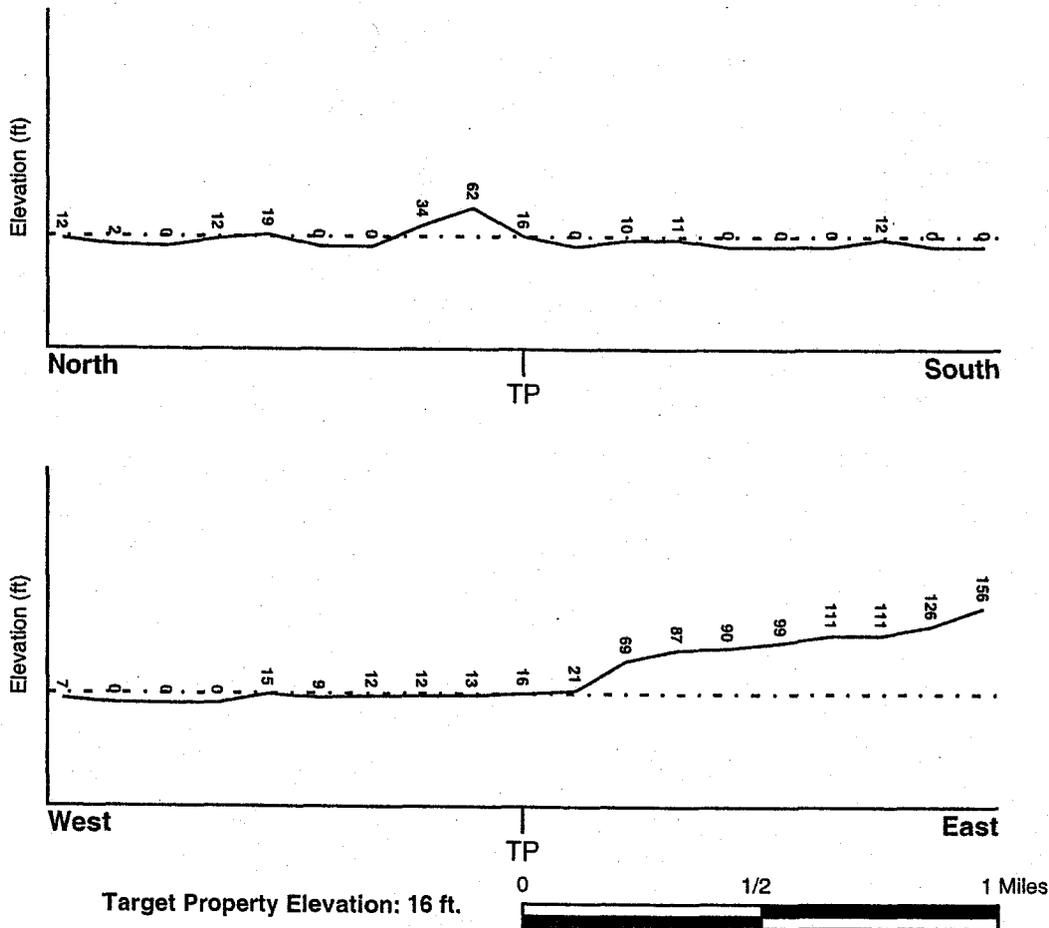
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map: 2433117-E8 NEWPORT BEACH, CA
General Topographic Gradient: General West
Source: USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County
ORANGE, CA

FEMA Flood
Electronic Data
YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 06059C0055E

Additional Panels in search area: 06059C0054E
06059C0062E

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property
NEWPORT BEACH

NWI Electronic
Data Coverage
YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data:*

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
A1	1/8 - 1/4 Mile NE	Not Reported
A2	1/8 - 1/4 Mile NE	Not Reported
A3	1/8 - 1/4 Mile NE	Not Reported
4	1/4 - 1/2 Mile SSE	Varies
B5	1/2 - 1 Mile NW	Varies
B6	1/2 - 1 Mile NW	Varies

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era: Cenozoic
System: Tertiary
Series: Miocene
Code: Tm (decoded above as Era, System & Series)

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

No soil data reported.

WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
---------------	----------------	-------------------------

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID

WELL ID

LOCATION
FROM TP

No PWS System Found

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

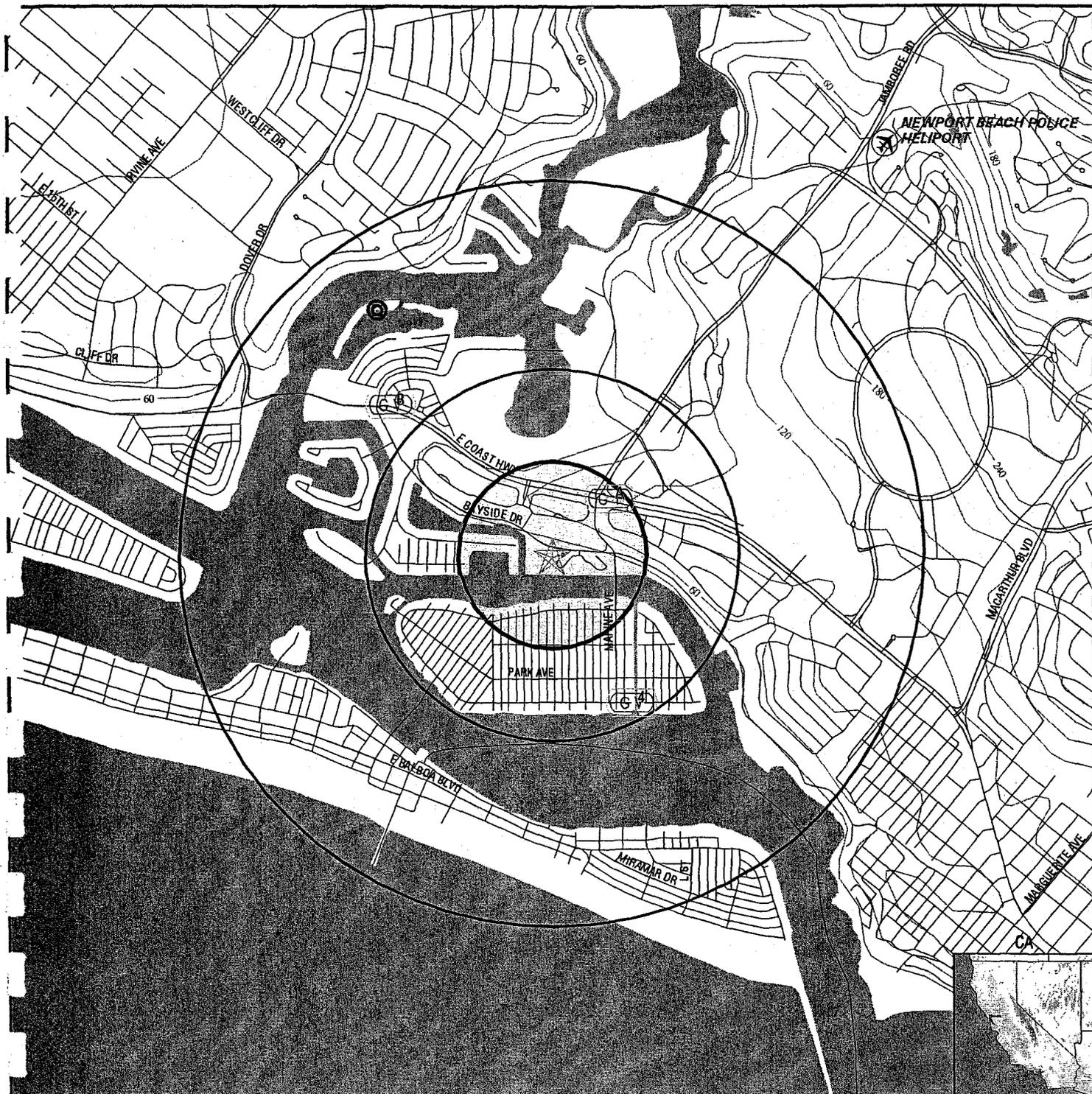
MAP ID

WELL ID

LOCATION
FROM TP

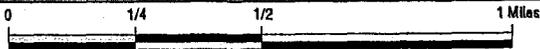
No Wells Found

PHYSICAL SETTING SOURCE MAP - 01072806.1r



- ✓ County Boundary
- ✓ Major Roads
- ~ Contour Lines
- ⚡ Earthquake Fault Lines
- ✈ Airports
- ⊙ Earthquake epicenter, Richter 5 or greater
- ⊕ Water Wells
- ⌋ Public Water Supply Wells
- Cluster of Multiple Icons

- ↑ Groundwater Flow Direction
- (G1) Indeterminate Groundwater Flow at Location
- (GV) Groundwater Flow Varies at Location
- (HD) Closest Hydrogeological Data
- Oil, gas or related wells



TARGET PROPERTY: Newport Marina Apartments
ADDRESS: 919 Bayside Dr
CITY/STATE/ZIP: Newport Beach CA 92660
LAT/LONG: 33.6105 / 117.8928

CUSTOMER: EnviroBusiness, Inc.
CONTACT: dakerblom
INQUIRY #: 01072806.1r
DATE: October 28, 2003 5:54 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database EDR ID Number

A1 NE 1/8 - 1/4 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083002129T Not Reported 5 10 Not Reported 12/04/1998	AQUIFLOW	65121
--	---	---	-----------------	--------------

A2 NE 1/8 - 1/4 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083000280T Not Reported 75 95 Not Reported 09/30/1998	AQUIFLOW	54860
--	---	--	-----------------	--------------

A3 NE 1/8 - 1/4 Mile Higher	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083000280T Not Reported 75 95 Not Reported 09/30/1998	AQUIFLOW	54859
--	---	--	-----------------	--------------

4 SSE 1/4 - 1/2 Mile Lower	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083001024T Varies 2.35 5.14 Not Reported 03/17/1992	AQUIFLOW	67205
---	---	--	-----------------	--------------

B5 NW 1/2 - 1 Mile Lower	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083000246T Varies Not Reported Not Reported 7.71 04/06/1999	AQUIFLOW	54864
---	---	--	-----------------	--------------

B6 NW 1/2 - 1 Mile Lower	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083000246T Varies Not Reported Not Reported 7.71 04/06/1999	AQUIFLOW	54863
---	---	--	-----------------	--------------

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for ORANGE County: 3

- Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level \geq 2 pCi/L and \leq 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for ORANGE COUNTY, CA

Number of sites tested: 30

<u>Area</u>	<u>Average Activity</u>	<u>% <4 pCi/L</u>	<u>% 4-20 pCi/L</u>	<u>% >20 pCi/L</u>
Living Area - 1st Floor	0.763 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)

Source: United States Geologic Survey

EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^R Information System

Source: EDR proprietary database of groundwater flow information

EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit

Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database

Source: Department of Agriculture, Natural Resources Conservation Services

The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

California Drinking Water Quality Database

Source: Department of Health Services

Telephone: 916-324-2319

The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations for District 2, 3, 5 and 6

Source: Department of Conservation

Telephone: 916-323-1779

RADON

Area Radon Information

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities

Source: Federal Aviation Administration, 800-457-6656

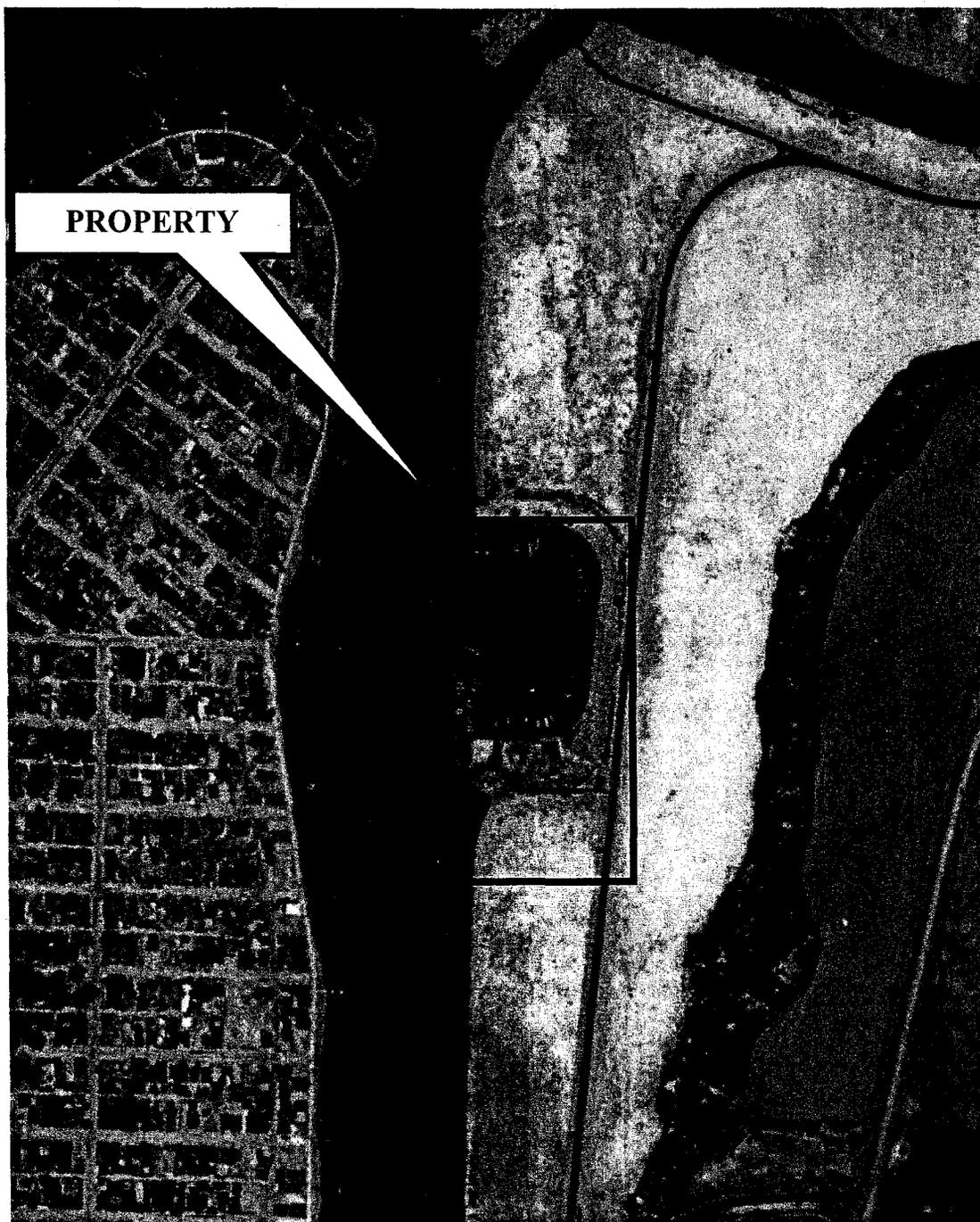
Epicenters: World earthquake epicenters, Richter 5 or greater

Source: Department of Commerce, National Oceanic and Atmospheric Administration

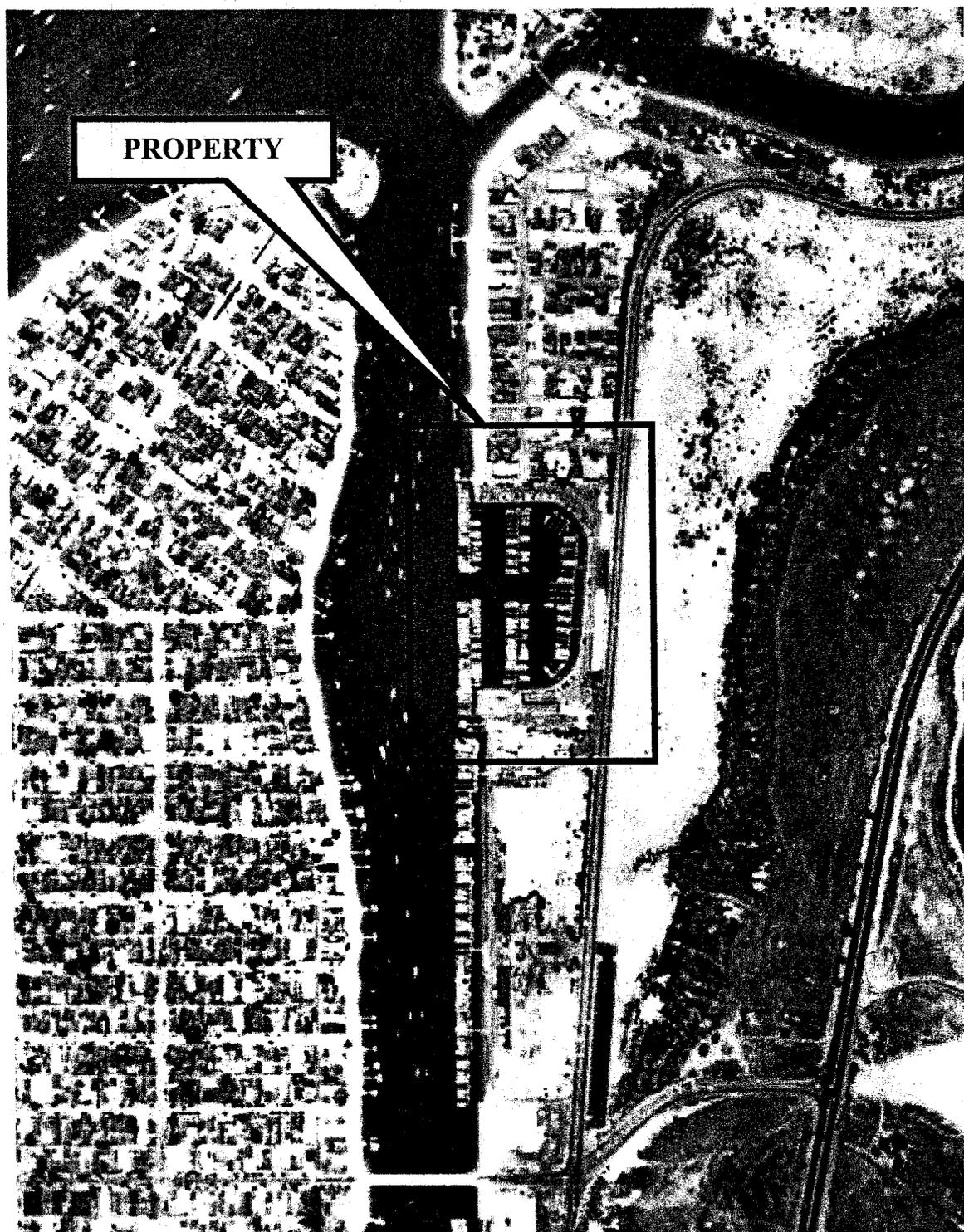
California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

APPENDIX F
HISTORICAL DOCUMENTATION

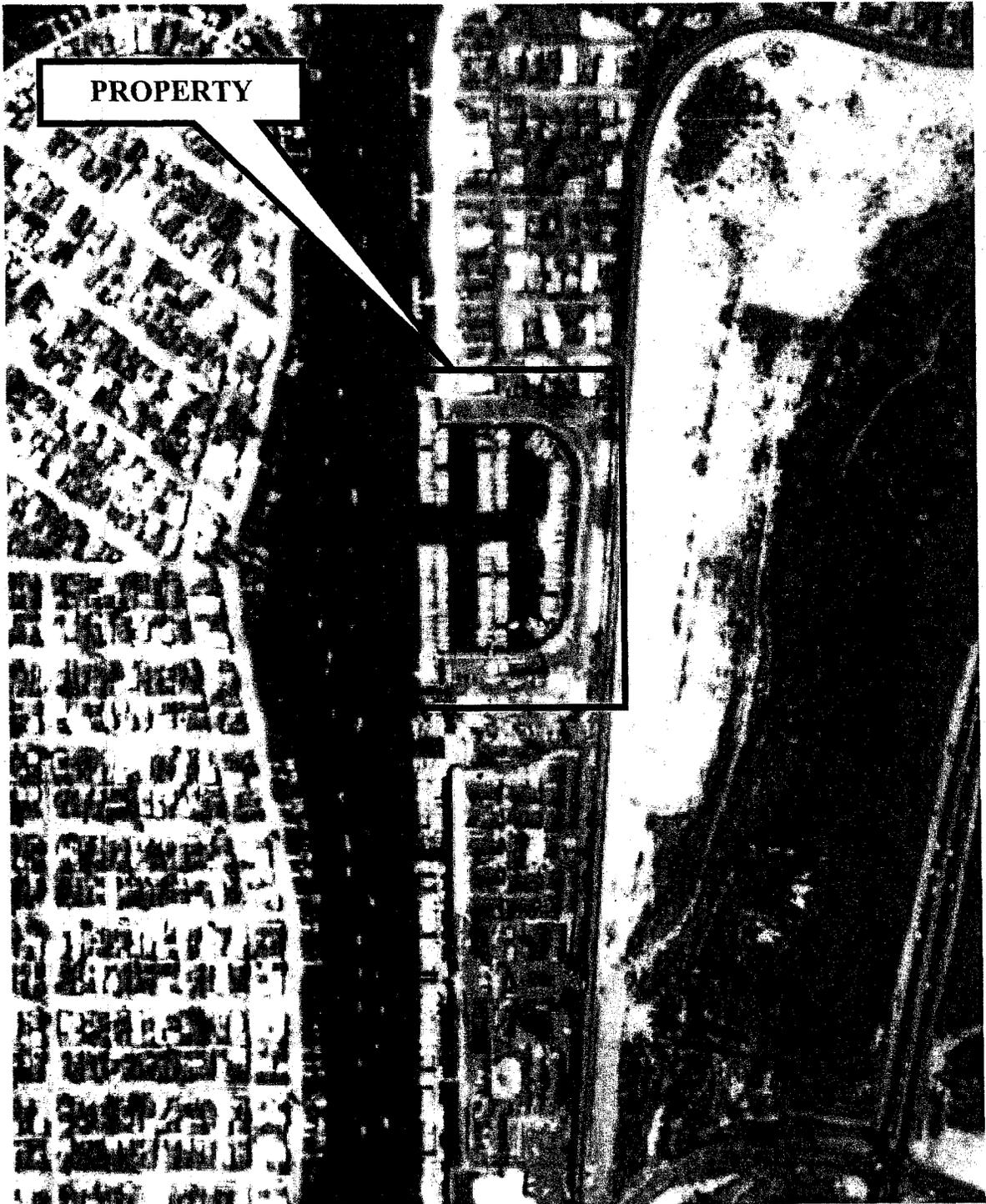
1938 (6-14-38) Rupp Aerial Photography, INC., AXK-49-50



1953 (5-30-53) Rupp Aerial Photography, INC., XK-6 K-3



1963 (2-28-63) Rupp Aerial Photography, INC., 3-8 GS VASK



1972 (10-30-72) Rupp Aerial Photography, INC., 3-231 GS-VCYY



1985 (12-12-85) Rupp Aerial Photography, INC., OC L22



1992 (1-8-92) Rupp Aerial Photography, INC., CVOR92-919



APPENDIX G
ANALYTICAL RESULTS

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237

804-275-4788 FAX 804-275-4907

LEAD IN PAINT ANALYSIS SUMMARY

CLIENT: EnviroBusiness, Inc.
Four A Street
Burlington, MA 01803

DATE OF SAMPLING: 11 NOV 2003
DATE OF RECEIPT: 14 NOV 2003
DATE OF ANALYSIS: 14 NOV 2003
DATE OF REPORT: 16 NOV 2003

CLIENT NUMBER: 22-4564 A
EHS PROJECT #: 11-03-1790
PROJECT: 23-2629

EHS SAMPLE#	CLIENT SAMPLE#	SAMPLE WEIGHT (g)	CONCENTRATION (% BY WEIGHT)
01	LP-1	0.009	1.8
02	LP-2	0.215	0.22
03	LP-3	0.145	0.077
04	LP-4	0.035	0.17
05	LP-5	0.054	0.30
06	LP-6	0.230	0.11
07	LP-7	0.238	0.24
08	LP-8	0.243	0.10

QUALITY CONTROL DATA

BATCH#:	111403P-3
INCLUSIVE EHS SAMPLE NUMBERS:	01-08
Continuing Calibration Verification 10 (10.0ppm Pb)	105% Recovery
Continuing Calibration Verification 5 (5.00ppm Pb)	99.8% Recovery
Laboratory Control Standard	96.1% Recovery
Matrix Spike	102% Recovery
Duplicate Relative Percent Difference	0.00 RPD
Reporting Limit	20.0ug
Method Detection Limit	2.0ug

PREPARATION METHOD: EPA 600/R-93/200
ANALYSIS METHOD: EPA SW846 7420

ANALYST: Bayard Vandegrift

Reviewed By Authorized Signatory:

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist
Michael A. Mueller, Quality Assurance Manager

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 22-4564 A

EHS PROJECT #: 11-03-1790

PROJECT: 23-2629

This method has been validated for sample weights of 0.020g or greater. When samples with a weight of less than that are analyzed those results fall outside of the scope of accreditations.

Sample results denoted with a "less than" (<) sign contain less than 20.0ug total lead, based on a 40ml sample volume.

Results represent the analysis of samples submitted by the client. Sample location, description, area, volume etc., was provided by the client. This report shall not be reproduced, except in full, without the written consent of Environmental Hazards Services, L.L.C. California Certification #2319 NY ELAP #11714

LEGEND	g = gram	ug = microgram	ppm = parts per million
	ml = milliliter	Pb = lead	

painpb08.dot/07JAN2002/MR

-- PAGE 02 of 02 -- END OF REPORT --

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

7469 WHITE PINE ROAD - RICHMOND, VA 23237

804-275-4788 FAX 804-275-4907

BULK ASBESTOS SAMPLE ANALYSIS SUMMARY

CLIENT: EnviroBusiness, Inc.
Four A Street
Burlington, MA 01803

DATE OF RECEIPT: 14 NOV 2003
DATE OF ANALYSIS: 14 NOV 2003
DATE OF REPORT: 16 NOV 2003

CLIENT NUMBER: 22-4564 A
EHS PROJECT #: 11-03-1791
PROJECT: 23-2629; 919 Bayside Drive; Newport Beach, CA

<u>EHS SAMPLE #</u>	<u>CLIENT SAMPLE #/ LABORATORY GROSS DESCRIPTION</u>	<u>% ASBESTOS</u>	<u>OTHER MATERIALS</u>
01	AC-1/ Yellow Fib.	NAD	91 Fibrous Glass 9% Non-Fibrous
02	AC-2/ Yellow Fib.	NAD	91% Fibrous Glass 9% Non-Fibrous
03	AC-3/ White Powder; White Gran.; Brown Fib.	Trace, <1% Chrysotile ★ <1% Total Asbestos ★3% chrysotile present in joint compound.	10% Cellulose 90% Non-Fibrous
04	AC-4/ White Gran.	NAD	100% Non-Fibrous
05	AC-5/ White/Gray Gran.	NAD	100% Non-Fibrous
06	AC-6/ White Gran.	3% Chrysotile 3% Total Asbestos	2% Cellulose 95% Non-Fibrous
07	AC-7/ Yellow Fib.	NAD	91% Fibrous Glass 9% Non-Fibrous
08	AC-8/ Gray Powder; Fib.	7% Chrysotile 7% Total Asbestos	3% Cellulose 90% Non-Fibrous
09	AC-9/ White/Gray Fib.	NAD	50% Cellulose 30% Fibrous Glass 20% Non-Fibrous
10	AC-10/ Yellow Fib.	NAD	95% Fibrous Glass 5% Non-Fibrous

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.

CLIENT NUMBER: 22-4564 A
EHS PROJECT #: 11-03-1791
PROJECT: 23-2629; 919 Bayside Drive; Newport Beach, CA

QC SAMPLE: M2-1999-3
QC BLANK: SRM 1866 Fiberglass
REPORTING LIMIT: 1% Asbestos
METHOD: Polarized Light Microscopy, EPA Method 600/R-93/116 *
ANALYST: Christian H. Schaible

Reviewed By Authorized Signatory: _____

Howard Varner, Laboratory Director
Irma Faszewski, Quality Assurance Coordinator
David Xu, MS, Senior Chemist
Feng Jiang, MS, Senior Geologist
Michael A. Mueller, Quality Assurance Manager

Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C. California Certification #2319 NY ELAP #11714. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), for enhanced detection capabilities) for materials regulated by the EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND NAD = no asbestos detected
SCF = suspected ceramic fibers

plm1.dot/07JAN2002/bc

-- PAGE 02 of 02-- END OF REPORT --

CHAIN OF CUSTODY FORM

Company Name: EBI Consultants Date: 11/2/03
 Address: 701 Concord Avenue, 2nd Floor Contact Name: BRIAN SMITH
 City, State, Zip: Cambridge, MA 02138 Sampler Name: BRIAN SMITH
 EHS Client Acct #: 22-4564 A EBI Project #: 23-2629
 Subject Property Address: 919 Bayside Drive
 Newport Beach CA Sampler's Phone #: 925-753-2100 Sampler's Fax #: 925-753-2109

Email all sampling results to dakerblom@ebiconsultants.com and kcurran@ebiconsultants.com. Sampling results no longer need to be faxed.

Sample Number *	Sample Date & Time *	Asbestos					Lead						Other Metals (Specify Below)				Comments * (color & type of material)		
		Bulk ID by PLM *	(PCM) Fiber Count	PLM Point Count	PLM Gravimetric	TEM AHERA (Air)	TEM Chatfield (Bulk)	Air	Paint (%) *	Paint (PPM)	Paint (mg/cm2)	Soil	Wipe	TCLP (Pb)	Waste Water	TCLP RCRA 8		Welding Fume	Toxic Metal Profile
AC-1	11-11-03	X																	Unit 0-5 Insulation
AC-2		X																	Unit 0-5 F-1 Insulation
AC-3		X																	Unit 0-5 Drywall
AC-4		X																	Main. Rm. Wall Plaster
AC-5		X																	Exterior Wall Stucco
AC-6		X																	Unit 0-5 clay texture
AC-7		X																	Unit H-4 Insulation
AC-8		X																	Unit H-4 Clay texture
AC-9		X																	Laundry room clay tile
AC-10	↓	X																	Pool wall insulation
LP-1																			Unit F-1 Door jamb.
LP-2																			BLDG 0 Handrail
LP-3																			BLDG L Wood trim
LP-4	↓																		Unit H-4 Furnace Door

* Must be filled out

Released by: BRIAN SMITH Signature: BS Date/Time: 11/2/03 10:00 am.
 Received by: _____ Signature: _____ Date/Time: _____
 Released by: _____ Signature: _____ Date/Time: _____

CHAIN OF CUSTODY FORM

Company Name: EBI Consultants Date: 11-12-03
 Address: 701 Concord Avenue, 2nd Floor Contact Name: BRIAN SMITH
 City, State, Zip: Cambridge, MA 02138 Sampler Name: Brian SMITH
 EHS Client Acct #: 22-4664-A EBI Project #: 23-2029
 Subject Property Address: 919 Bayside Drive Newport Beach CA Sampler's Phone #: 925-753-2100 Sampler's Fax #: 925-753-2109

Email all sampling results to dakerblom@ebiconsultants.com and kcurran@ebiconsultants.com. Sampling results no longer need to be faxed.

Sample Number *	Sample Date & Time *	Asbestos						Lead					Other Metals (Specify Below)				Comments * (color & type of material)		
		Bulk ID by PLM *	(PCM) Fiber Count	PLM Point Count	PLM Gravimetric	TEM AHERA (Air)	TEM Chalfield (Bulk)	Air	Paint (%) *	Paint (PPM)	Paint (mg/cm2)	Soil	Wipe	TCLP (Pb)	Waste Water	TCLP RCRA 8		Welding Fume	Toxic Metal Profile
LP-5								X											Unit H-4 Closet
LP-6								X											Unit H-4 Bedroom Door jamb
LP-7								X											Unit L-3 Door Jamb
LP-8								X											Unit Bldg H Wood trim

* Must be filled out

Released by: Brian Smith Signature: [Signature] Date/Time: 11-12-03 10:00 AM
 Received by: _____ Signature: _____ Date/Time: _____
 Released by: _____ Signature: _____ Date/Time: _____
 Received by: _____ Signature: _____ Date/Time: _____

APPENDIX H
PORTIONS OF PREVIOUS REPORTS



DAMES & MOORE

A DAMES & MOORE GROUP COMPANY

**REPORT
PHASE I ENVIRONMENTAL SITE ASSESSMENT
NEWPORT MARINA APARTMENTS
919 BAYSIDE DRIVE
NEWPORT BEACH, CALIFORNIA**

**PREPARED FOR:
CATELLUS DEVELOPMENT CORPORATION
D&M JOB NO. 14858-197-042**

OCTOBER 25, 1999

**Dames & Moore, Inc.
911 Wiltshire Boulevard, Suite 700
Los Angeles, California 90017
(213) 996-2200**



October 25, 1999

Mr. Jim Adams
Catellus Development Corporation
201 Mission Street
San Francisco, CA 94105

Re: Report
Phase I Environmental Site Assessment
Newport Marina Apartments
919 Bayside Drive
Newport Beach, California
Dames & Moore Job No. 14858-197-042

Dear Mr. Adams:

Transmitted with this letter is one copy of our report entitled "Phase I Environmental Site Assessment" for the Newport Marina Apartments in the City of Newport Beach, Orange County, California. Thank you for the opportunity to be of assistance on this project.

We trust this report provides you with the information you require at this time. Should you have any questions regarding the information presented in this report, or need further assistance, please contact us.

Sincerely,
DAMES & MOORE

Debra B. Stott
Senior Geologist

James E. McNally
Associate

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1.4 LIMITING CONDITIONS AND METHODOLOGY USED	2
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Appendix A - Site Photographs

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EXECUTIVE SUMMARY

Presented in this report are the results of Dames & Moore's Phase I Environmental Site Assessment (Phase I ESA) for the Newport Marina Apartments complex in the City of Newport Beach, Orange County, California. This assessment was accomplished by, and limited to, a site reconnaissance, a drive-by survey of the site vicinity, and a review of available pertinent documentation available through Dames & Moore's standard resources regarding past and current land use for indications of the manufacture, generation, use, storage and/or disposal of hazardous substances at the site. Information from previous reports has been used in the assessment of this property.

The Scope of Services performed is in accordance with our proposal to Catellus Development Corporation, dated September 29, 1999. The format and content of this Phase I ESA is in general accordance with the ASTM Standard Practice for Environmental Site Assessments: Phase I Site Assessment Process E-1527. It is Dames & Moore's understanding that the Catellus Development Corporation is planning to purchase the property.

The subject property is located on the south side of Bayside Drive, in between Jamboree Road and Promontory Drive in the City of Newport Beach, Orange County, California. The specific site address is 919 Bayside Drive. The site vicinity consists of other residential and commercial properties. The approximately 4 acre property consists of 64 residential apartments, covered and uncovered asphalt paved parking spaces, a swimming pool, landscaped areas, and boat docks

No evidence of manufacturing involving the use or storage of hazardous materials was observed at the subject properties. The subject properties was not identified on agency database lists of known or potential hazardous waste sites, landfills, or sites under investigation for known or potential environmental violations.

The historical data reviewed dates back to 1947, when the sites were shown on an aerial photograph as an undeveloped sandy beach. The subject properties appeared to be undeveloped land until 1959 when the first 50 apartment units were constructed. The additional 14 apartment units were completed between 1973 and 1976.

PHASE I ENVIRONMENTAL SITE ASSESSMENT

A number of sites in the vicinity of the subject property are included on agency environmental database lists. Based on a review of EDR agency lists, there is low potential for the listed sites to adversely affect the subject property.

During performance of this Phase I ESA, a recognized environmental condition was not identified due to current and past onsite operations. Dames & Moore does not recommend additional investigation of the property at this time.

1.0 INTRODUCTION

Presented in this report are the results of Dames & Moore's Phase I Environmental Site Assessment (Phase I ESA) for the Newport Marina Apartments complex in the City of Newport Beach, Orange County, California (Figure 1). The approximately 4 acre subject property consists approximately 81,000 square feet of residential apartments, divided into 64 units.

1.1 PURPOSE

The purpose of this Phase I ESA was to review past and present land use practices and site conditions to assess potential environmental impacts and to identify Recognized Environmental Conditions in connection with the subject property. By definition under ASTM designation E 1527, the term "Recognized Environmental Conditions" means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

1.2 SPECIAL TERMS AND CONDITIONS

The Scope of Services performed is in accordance with our proposal to Catellus Development Corporation, dated September 29, 1999. The format and content of this Phase I ESA is in general accordance with the ASTM Standard Practice for Environmental Site Assessments: Phase I Site Assessment Process. It is Dames & Moore's understanding that the Catellus Development will be purchasing the property.

1.3 LIMITATIONS AND EXCEPTIONS OF THE ASSESSMENT

The conclusions presented in this report are professional opinions based solely upon indicated data described in this report, visual observations of the site and vicinity, and our interpretation of the available historical information and documents reviewed, as described in this report. The conclusions are intended exclusively for the purpose outlined herein and the site locations and project indicated. The Scope of Services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings, conclusions, or recommendations presented herein is at the sole risk of said user.

It should be recognized that this study was not intended to be a definitive investigation of contamination at the subject property and the recommendations provided are not necessarily inclusive of all the possible conditions. Given that the Scope of Services for this investigation was limited and that exploratory borings, soil and/or groundwater sampling were not undertaken, it is possible that currently unrecognized contamination may exist at the site.

Opinions and recommendations presented herein apply to the site conditions existing at the time of our investigations and cannot necessarily apply to site changes of which Dames & Moore is not aware and has not had the opportunity to evaluate. Changes in the conditions of this property may occur with time due to natural processes or the works of man on the subject site or adjacent properties. Changes in applicable standards may also occur as a result of legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

1.4 LIMITING CONDITIONS AND METHODOLOGY USED

This assessment was accomplished by, and limited to, a site reconnaissance, a drive-by survey of the site vicinity, and a review of available pertinent documentation available through Dames & Moore's standard resources regarding past and current land use for indications of the manufacture, generation, use, storage and/or disposal of hazardous substances at the site. To meet the objective of this assessment, Dames & Moore completed the following tasks:

- Performed a reconnaissance survey of the subject property to make visual observations of existing site conditions and activities, and a drive-by survey of the area within ¼-mile of the site to observe types of general land use within the search area. Photographs of site are provided in Appendix A.
- Conducted interviews with site personnel to evaluate the site history, and operation and maintenance procedures.
- Reviewed the federal, state, and local database list search provided by Environmental Data Resource, Inc., (EDR) of known or potential hazardous waste sites or landfills, and sites currently under investigation for environmental violations. The agency lists and search radii are provided in Appendix B.
- Conducted inquiries in person, by telephone, or in writing to the appropriate regulatory agencies for information regarding environmental permits, violations or incidents, and/or the status of enforcement actions at the subject property.
- Prepared this report describing the research performed and presenting Dames & Moore's findings and professional opinions regarding the potential for adverse environmental impacts to the subject site.

2.0 SITE DESCRIPTION

2.1 LOCATION

The subject property is located on the south side of Bayside Drive, in between Jamboree Road and Promontory Drive in the City of Newport Beach, Orange County, California. The specific site address is 919 Bayside Drive. The site vicinity consists of other residential and commercial properties.

2.2 SITE RECONNAISSANCE & INTERVIEWS

On October 13, 1999, Mr. Robert Forster, a Dames & Moore representative, conducted a reconnaissance of the subject property. The reconnaissance consisted of the observation and documentation of existing site conditions and nature of the neighboring property development within ¼ mile of the site.

The approximately 4 acre property consists of 64 residential apartments, covered and uncovered asphalt paved parking spaces, a swimming pool, landscaped areas, and boat docks. Interviews were conducted with Ms. Millie McNeilly and Ms. Sandra Stonecypher, property managers from McLain Enterprises.

2.2.1 Hazardous Substances

Present Use

No significant use or storage of hazardous or regulated substances was observed onsite. Indications of environmental permits for use or disposal of hazardous substances or wastes were not found for current or past uses of the subject property.

Containers (less than 1 gallon) of household cleaners were observed in the janitorial storage areas, along with approximately 10 gallons of paint in 1-gallon cans, less than 1 gallon of paint thinner in a 1-gallon can, and one gallon of gasoline in a 5-gallon plastic container. In addition, five gallons of chlorine were observed in a 5-gallon container in the pool house.

Past Use

None observed or known.

2.2.2 Storage Tanks

Evidence of underground storage tanks (vent lines, fill or overfill ports, fuel pumps) was not observed. No aboveground storage tanks were observed at the time of the site visit. No indication of the past presence of aboveground or underground storage tanks was found.

2.2.3 Polychlorinated Biphenyls (PCBs)

Evidence of PCBs was not observed. Several concrete-pad mounted transformers maintained by Southern California Edison were observed throughout the subject property.

2.2.4 Waste Disposal

Four garbage dumpsters were observed on the subject property. Municipal waste is removed from the subject property by Stanton Disposal Company on a regulatory basis. The dumpster areas appeared to be well maintained. No evidence of staining or unusual odors were noted. According to Ms. McNeilly, no waste oil or other hazardous materials are stored on the boat docks, and no hazardous waste is generated onsite.

2.2.5 Wetlands, Floodplain, Coastal Zone

Wetlands were not observed on or adjacent to the subject properties.

2.2.6 Drums/other Chemical Containers

Drums and chemical containers were not observed onsite.

2.2.7 Dumping

Evidence of dumping was not observed onsite.

2.3 CURRENT USES OF ADJACENT PROPERTY

The sites are located within an area that primarily consist of residential and commercial properties in the City of Newport Beach, California (Figure 2). In general, prominent adjoining land uses are as follows:

- North: Across Bayside Drive are the Promontory Point Villa Apartments, a restaurant currently under constriction, a Pavilions Grocery Store, and a retail shopping center.
- South: Adjacent to the southern portion of the subject property are boat docks, beyond which is the Beacon Bay portion of the Newport Harbor.
- East: Adjacent to the east are residential condominiums.
- West: Adjacent to the west is a channel of the harbor, beyond which are the Balboa Yacht Basin, the Galley Cafe, and residential homes.

2.4 HISTORICAL USE

Dames & Moore conducted personal interviews and reviewed selected historical aerial photographs for the subject property. The aerial photographs were reviewed for evidence of activities which would suggest the potential presence of hazardous substances at the site and to evaluate the potential for the site to be impacted by offsite sources of contamination. Sanborn Mapping and Geographic Services does not provide coverage for the subject property. The following section provide a summary of the review.

2.4.1 Aerial Photographs

Aerial photographic images were obtained from Environmental Data Resources (EDR) from Southport, Connecticut, with coverage of the subject properties from 1947, 1954, 1968, 1977, 1989, and 1994.

1947 According to the aerial photograph from this year, the subject property appeared to be a vacant beach. Along the southern boundary of the property were boat docks along the channel of the Newport Harbor. On the other side of the harbor channel, further to the south,

was Balboa Island with residential homes. To the north of the site was Bayside Drive, beyond which was more undeveloped land. Adjacent to the east of the site was more undeveloped beach property. Approximately 1/8 mile to the east were two structures, beyond which was Jamboree Road. Adjacent to the west was a drainage channel, beyond which was the Balboa Yacht Basin and more boat docks.

- 1954 The subject property and the vicinity in this photograph appear to be unchanged. Several properties to the east of the site, along the drainage channel, appear to be under development.
- 1968 According to the aerial photograph, the subject property appears to be developed with residential apartments. According to Ms. McNeilly, only 50 apartment units were completed at this time. To the north across Bayside Drive was a large commercial shopping center, in the same orientation as the current Pavilions Grocery store and adjacent shopping stores. Adjacent to the east, residential condominiums were also developed. The remainder of the vicinity appeared unchanged.
- 1977 According to the aerial photograph, the remainder of the northern portion of the subject property was further developed, and the subject property appeared as it does today. According to Ms. McNeilly, an additional 14 apartment units were added in the mid-1970's. Across Bayside Drive to the north, the Promontory Point Villa Apartment were developed. Adjacent to the west, an additional, concrete lined harbor channel was developed in the location of the former drainage channel.
- 1989 The aerial photograph from this year depicts the subject property and vicinity as they appear today. The Balboa Yacht Basin appears to have been renovated to accommodate more boats in the boat dock area.
- 1994 The subject property and vicinity appear unchanged.

2.4.2 City of Newport Beach Historical Information

Dames & Moore reviewed available files at both the City of Newport Beach Building & Planning Department and the City of Newport Beach Fire Department. The files were reviewed for evidence

of activities which would suggest the potential presence or former presence of hazardous substances or contamination at the site.

According to the available files, the subject property was originally developed in 1959 for the Volk-McLain Company, and additions were completed between 1973 and 1976 for the McLain Development Company. Ms. McNeilly confirmed that originally 50 apartment units were constructed in 1959, and an additional 14 units were constructed in the mid-1970's. The rental office and storage rooms were added to the property in 1983, and other tenant improvements were completed in 1993.

3.0 RECORDS REVIEW

Dames & Moore reviewed readily available records regarding past and current site use, contacted applicable agencies regarding environmental concerns at the site, and reviewed the agency database list search for environmental concerns at surrounding properties. The information obtained during the records review is provided in the following sections.

3.1 AGENCY RECORD REVIEW

3.1.1 Database List Search

Dames & Moore contracted Environmental Data Resource, Inc., (EDR) to provide a review of the publicly available federal, state, and local databases of known or potential hazardous waste sites or landfills and sites currently under investigation for environmental violations for the site address and the surrounding area. The EDR-Radius Map Report along with descriptions of each federal, state, and local lists are included in Appendix B. Facilities located adjacent to or hydraulically up-gradient from the site with respect to the inferred southerly groundwater flow direction, are discussed below.

EDR-listed properties interpreted as hydraulically down-gradient or cross-gradient from the site relative to groundwater flow direction are in our opinion unlikely to impact the site with hazardous materials and are therefore excluded from the following discussion.

3.1.1.1 Site

The subject property was not listed in the database search.

3.1.1.2 Offsite

Federal (NPL) or State (SPL) Superfund listings were not identified within 1-mile of the site. Six sites identified by the California Environmental Protection Agency as potentially toxic material (CORTESE sites) were identified within a ½ mile radius of the subject property. Eleven leaking underground storage tank (LUST) sites were listed within ½-mile of the site and one registered UST/AST facility was identified within ¼-mile of the site. One RCRA Small Quantity Generator (SQG) site was located within ⅓ mile of the subject property. No Emergency Response Notification System (ERNS) or state spills sites were identified within ⅓-mile of the site.

The following is a summary of information provided in the EDR-Radius Map Report regarding sites located adjacent to or up-gradient of the subject property. The location of these sites is shown on the radius maps accompanying the EDR report in Appendix B. Numbers in parentheses in the following paragraphs refer to the map identification number in the EDR maps and report.

- Mobil Service Station #18 (1, A5, A6, and 7) was located at 301 and 1000 Pacific Coast Highway, approximately 900 feet to the north of the subject property. This facility was also reported at 1500 Balboa Avenue (9), on Balboa Island to the south. This facility was included in the CORTESE and LUST databases. Four underground storage tanks (ranging from 280-gallons to 8,000-gallons) for the storage of waste oil, regular gasoline, and unleaded gasoline were also registered at the Pacific Coast Highway facility under the name Robert Wayne Morgan (A4) in the UST database. In 1982 a release of gasoline was reported to have impacted local groundwater. Free product was removed and remediation activities were conducted, and the site received closure from the Santa Ana Region of the California Regional Water Quality Control Board in 1994. Based on the regulatory status of this site, it is the opinion of Dames & Moore that the potential for this site to currently impact the subject property is low.

- Shell Service Station (A2 and A3) was located at 990 Pacific Coast Highway, approximately 960 feet to the northeast of the subject property. This facility was reported in the CORTESE and LUST databases. In 1992, a release of gasoline was reported to have impacted local groundwater. A remediation plan was reported to have been developed, but no current status is reported. Based on the crossgradient location and distance from the subject property, it is the opinion of Dames & Moore that the potential for this site to have impacted the subject property is low.
- Newport Imports (8) was reported at 1200 Pacific Coast Highway, approximately ¼ mile to the east-northeast of the subject property. This facility was included in the LUST database for a release of waste oil into groundwater. Remedial activities were conducted, and the case was closed in 1994. Based on the regulatory status of this site, it is the opinion of Dames & Moore that the potential for this site to impact the subject property is low.
- Newport Auto Center (B10 and B11) was reported at 445 Pacific Coast Highway, approximately ½ mile to the northwest of the subject property. This facility was included in the CORTESE, UST, LUST, and SQG databases. Eight underground storage tanks (ranging in size from 250-gallons to 10,000-gallons) for the storage of gasoline and waste oil were installed in the property in 1968. A release to local soil was reported, and the case was closed in 1992. In 1993, a second release of waste oil impacting groundwater was reported. According to the LUST database, a remediation plan was submitted, but no current status is reported. Based on the crossgradient location and distance from the subject property, it is the opinion of Dames & Moore that the potential for this site to have impacted the subject property is low.

3.1.2 Agency Contacts

In addition to the database list search, Dames & Moore contacted state and local regulatory agencies to obtain information regarding the environmental condition of the subject property. The following information was received from these agencies:

- Based on a letter dated October 18, 1999, from the State of California Environmental Protection Agency, Department of Toxic Substances Control, there are no records for the subject property.
- Based on a letter dated October 19, 1999, from the South Coast Air Quality Management District, there were no records found for the subject property.
- Based on a letter dated October 25, 1999, from the County of Orange Health Care Agency, no records for the subject property were found.
- According to a telephone conversation with a representative from the California Regional Water Quality Control Board, Santa Ana Region, there are no records for the subject property.
- According to a letter dated October 13, 1999, the State of California Fire Marshal's Office stated that there were no pipelines located on the subject property.

3.2 PHYSICAL SETTING

Dames & Moore reviewed pertinent maps and readily available literature for information on the physiography and hydrogeology of the site. A summary of this information is presented in the following subsections.

3.2.1 Topography

The subject property is located in Township 6 South, Range 10 West, Section 35, within the City of Newport Beach, Orange County, California. Topographic map coverage of the site vicinity is provided by the U.S. Geologic Survey (USGS), 7.5 minute "Newport Beach, California" quadrangle (1965, photo revised 1981). The elevation of the subject properties is approximately 10 feet above mean sea level (MSL). The subject property is bounded by Beacon Bay to the south.

3.2.2 Geology and Hydrogeology

The subject property is located within the Coastal Plan of the Orange County Basin, which is underlain by a deep structural depression containing primarily of Middle Miocene sedimentary rocks. The rapid rate of deposition of the rock units, accompanied by folding and faulting, has resulted in marked lateral variations in the thickness and lithology encountered in the subsurface. The deposits have been reported to be hybrid marine and continental units; at the site the surface geology is mapped as alluvium, beach sand, and artificial fill comprised of unconsolidated and poorly consolidated gravel, sand, and silt (DWR, 1967).

The Newport-Inglewood uplift is a major regional feature extending 42 miles in a northwest-southeast direction from Beverly Hills in Los Angeles County through Newport Beach in Orange County. Rocks generally dip downward toward the ocean and landward from the axis of this faulted, anticlinal feature. The surface expression of the uplifted belt is an alignment of low hills and coastal mesas, transected by several gaps. The landforms represent a deformed Pleistocene surface, and the gaps are erosional features (DWR, 1967).

The water-bearing deposits in Orange County are, for the most part, unconsolidated or semiconsolidated alluvial sediments that are Quaternary or Tertiary in age (DWR, 1967). Specific site hydrogeology is not available. However, based on the proximity of the property to the Newport Harbor, it can be assumed that water would be encountered within the first 5 to 10 feet below the ground surface.

4.0 CONCLUSIONS AND RECOMMENDATIONS

During performance of this Phase I ESA, recognized environmental conditions were not identified due to current and past onsite operations. Dames & Moore does not recommend additional investigation of the properties at this time.

-000-

REFERENCES

- California Environmental Protection Agency, Department of Toxic Substances Control, letter dated October 18, 1999.
- California Regional Water Quality Control Board, Santa Ana Region, telephone communication, October 13, 1999.
- California Department of Water Resources (DWR), "Progress Report on Ground Water Geology of the Coastal Plain of Orange County," July 1967.
- City of Newport Beach Department of Building & Planning, agency visit, October 13, 1999.
- City of Newport Beach Fire Department, agency visit, October 13, 1999.
- County of Orange Health Care Agency, letter dated October 25, 1999.
- Environmental Data Resources, Inc. (EDR), "The EDR-Radius Map Report: Bayside Apartments," Inquiry Number 1420081.1p, October 8, 1999.
- Environmental Data Resources, Inc. (EDR), "The EDR-Aerial Photography Print Service: Bayside Apartments," Inquiry Number 420081-8, October 13, 1999.
- Environmental Protection Agency, Region 9, Sole Source Aquifer Map, January 1998.
- Munger Map Book of California and Alaska Oil and Gas Fields, 1997 edition.
- South Coast Air Quality Management District, letter dated October 19, 1999.
- United States Geological Survey (USGS), "Newport Beach, California" Quadrangle, 7.5 minute map, 1965, (photo revised 1981).

August 18, 2000

Standard Pacific Corporation
15326 Alton Parkway
Irvine, California 92618

Attention: Mr. Gary Jones

Proposal
Phase I Environmental Site Assessment Update
Newport Marina Apartments
Newport Beach, California

Dear Mr. Jones:

1.0 INTRODUCTION

URS Corporation Americas is pleased to submit this proposal to perform an Environmental Site Assessment Update (ESAU) for the above referenced property (site or subject property) to Standard Pacific Corporation. URS Corporation Americas as Dames & Moore previously prepared an ESA for the property on behalf of Catellus Development Corporation dated October 1999. The update will consist of a new ESA report describing current site conditions and any changes since the previous report and new regulatory agency contacts. Information from the previous report will be used as part of the update.

2.0 PURPOSE AND SCOPE OF SERVICES

The purpose of the proposed Environmental Site Assessment Update will be to review past and present land use practices and site operations to evaluate the potential presence of hazardous substances and soil and/or groundwater contamination at the site. This assessment will be accomplished by, a review and evaluation of past and current uses of the site for indications of the manufacture, generation, use, storage and/or disposal of hazardous substances at the site, and the potential for soil and/or groundwater contamination resulting from past and present site land use activities and nearby off site operations based upon the scope of services described below. If, based upon this preliminary data review, a potential for environmental impairment or contamination is

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URS Corporation
911 Wilshire Boulevard, Suite 800
Los Angeles, CA 90017-3437
Tel: 213.996.2200
Fax: 213.996.2458

Standard Pacific Corporation

August 18, 2000

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identified, recommendations for further investigations will be developed to evaluate whether contamination may exist at the locations identified.

The scope of services for the ESAU will include the following elements:

- Review of available documents regarding past and/or current site development provided by Standard Pacific Corporation. URS Corporation Americas will not order a title report for the property;
- Performance of a reconnaissance survey of the subject property and the area within a 1/4-mile radius of the site to make visual observations of existing site conditions and activities and types of land use and businesses within the search area. It shall be the responsibility of Standard Pacific Corporation to obtain the owner's and/or tenants' permission to enter the site prior to our visit. More detailed information will be obtained from the property manager or tenant if the tenant's business is likely to involve the use or disposal of hazardous materials. During the site visit, URS Corporation Americas will note the use or storage of hazardous or industrial chemicals or petroleum products, including amounts stored onsite, and method of storage. If access is unavailable to any portions of the subject property, URS Corporation Americas's ability to complete the scope of services described herein may be hindered;
- Identification of the presence of above-ground or indications of the presence of underground storage tanks and of the presence of transformers onsite that may be PCB-contaminated. If USTs or ASTs are present, URS Corporation Americas will attempt to obtain information regarding the number of tanks, materials stored, tank testing records, and whether or not the tanks are registered;
- Review of the following agency lists of known or potential hazardous waste sites or site investigations for hazardous substances or environmental violations at the sites or in the site vicinities.

ENVIRONMENTAL AGENCY DATA	
Agency Database	Survey Distance
United States Environmental Protection Agency (US EPA) National Priority List (NPL) for Superfund Sites	1.0 mile
US EPA Comprehensive Environmental Response, Compensation and Liability Index System (CERCLIS) List for Sites Under Review	.5 mile
US EPA Resource Conservation and Recovery Act Hazardous Waste Data Management System (RCRA/HWDMSA) Report for Permitted Transportation, Storage, and Disposal (TSD) Facilities	1.0 mile
US EPA RCRA/HWDMSA Corrective Action Sites List (CORRACTS)	1.0 mile
US EPA RCRA/HWDMSA List of Violations/Enforcement Actions (RCRA-Viol)	.25 mile
US EPA RCRA/HWDMSA Report for Large and Small Quantity Generators of Hazardous Waste (GNRTR)	.13 mile
US EPA Emergency Response Notification System List (ERNS)	.13 mile
California Environmental Protection Agency (Cal-EPA) State Equivalent Priority List (SPL) Annual Workplan Sites (AWP-CALSITES Database) or State Equivalent	1.0 mile
Cal-EPA State Equivalent CERCLIS List (SCL)	.5 mile
State Solid Waste Information System (SWIS), and Waste Management Unit Database System (WMUDS); and County Landfill and Transfer Stations Databases (SWLF, LAC-Landfills) or State Equivalent	.5 mile
State/County list of Leaking Underground Storage Tanks (LUST)	.5 mile
State/County list of registered Underground and Aboveground (UST/AST) Storage Tanks	.25 mile

Standard Pacific Corporation

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- For sites in California, the Munger Map Book of California and Alaska Oil and Gas Fields dated 1997.
- Conduct inquiries by telephone or writing to applicable municipal, county, and state regulatory agencies for information regarding building or environmental permits, environmental violations or incidents and/or status of enforcement actions at the subject property. Agency contacts will include as appropriate: City Fire Departments, City Building and Safety Departments, and as appropriate - Air Quality Management Districts, State EPA and State Regional Water Quality Control Board. URS Corporation Americas's inquiries do not include review of complete files available at these agencies. If a complete file review is necessary, URS Corporation Americas will do so on a time and materials basis;
- Conduct interviews with subject property owner(s), property manager(s), tenants, and maintenance personnel, as available or appropriate, to evaluate site history and operation and maintenance procedures. It shall be the responsibility of Standard Pacific Corporation to arrange the interview between URS Corporation Americas and other appropriate parties at the time of our site visit;
- Preparation of a letter final reports describing the research performed and presenting URS Corporation Americas's findings and professional opinion regarding the potential for environmental impairment at the subject site.

It is possible that the ESAU may reveal the need to perform additional Phase II field investigations (including surface, subsurface and/or air sampling) to assess the potential presence or absence of contaminated soil and/or groundwater beneath the site. Such investigations are not included in URS Corporation Americas's Scope of Services described herein, but recommendations may be provided. If Phase II subsurface or other additional investigations are recommended, a generalized scope of services and justification and rationale for the scope will be provided.

URS Corporation Americas's services as described in this proposal specifically exclude assessment of lead in drinking water, collection of asbestos and lead paint samples, and radon gas at the subject property.

Standard Pacific Corporation
August 18, 2000
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3.0 SCHEDULE AND ESTIMATED CHARGES

URS Corporation Americas is prepared to begin this investigation immediately upon receipt of written authorization to proceed from Standard Pacific Corporation. We understand that you require a report within approximately three weeks. This anticipated schedule is partially dependent on the availability of and access to agency files and data. URS Corporation Americas will communicate immediately with Standard Pacific Corporation if information is discovered that suggests significant environmental concerns at the site.

We propose to provide services for this ESAU as outlined in this proposal following the ASTM Phase I format on a lump sum basis for \$1,800.

4.0 TERMS AND CONDITIONS/LIMITATIONS

The terms and limits of URS Corporation Americas's liability and scope of services are provided in the attached General Conditions (Form 115.6 (10-94/D)RII), and are made a part of this proposal. URS Corporation Americas calls your attention to the warranty and liability provisions described under Section 2.0 of the General Conditions. Unless specifically and explicitly negotiated otherwise prior to the initiation of work and with the agreement to pay an additional fee, URS Corporation Americas's liability will be limited as described in the General Conditions.

Services performed by URS Corporation Americas will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the same profession currently practicing in the same locality under similar conditions. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental liabilities on a particular site. Therefore, URS Corporation Americas cannot act as insurers and cannot "certify" that a site is free of environmental contamination. No expressed or implied representation or warranty is included or intended in our reports, except that our services were performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession.

Standard Pacific Corporation

August 18, 2000

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Services performed by URS Corporation Americas will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the same profession currently practicing in the same locality under similar conditions. It is important to recognize that even the most comprehensive scope of services may fail to detect environmental liabilities on a particular site. Therefore, URS Corporation Americas cannot act as insurers and cannot "certify" that a site is free of environmental contamination. No expressed or implied representation or warranty is included or intended in our reports, except that our services were performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession.

URS Corporation Americas trusts the services outlined in this proposal meet your current requirements. If this proposal is satisfactory, please complete the attached authorization statement to indicate your approval of the scope of services and fee. A signed, complete copy of this proposal returned to us will serve as URS Corporation Americas's formal authorization to proceed. An additional copy of this proposal is provided for your files. This proposal and its attachments will constitute the contractual agreement between Standard Pacific Corporation and URS Corporation Americas for the services described herein. The services and estimate presented herein are applicable for a period of 30 days from the date of this proposal.

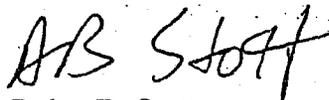
Standard Pacific Corporation

August 18, 2000

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Thank you for the opportunity to be of assistance. Please contact us if you have any questions or require further assistance.

Very truly yours,
URS Corporation Americas, INC.



Debra B. Stott
Senior Geologist

Attachment: General Conditions-Form D

ACCEPTANCE: URS Corporation Americas is authorized to proceed with the scope of services described herein.

CARLY JONES / Carly Jones
Name

STANDARD PACIFIC CORP.
Company

AUTHORIZED REP
Title

9/24/00
Date

GENERAL CONDITIONS—FORM D

1.0 BILLING

- 1.1 Invoices will be issued every four weeks, payable upon receipt, unless otherwise agreed.
- 1.2 Interest of 1½% per month (but not exceeding the maximum rate allowable by law) will be payable on any amounts not paid within 30 days, payment thereafter to be applied first to accrued interest and then to the principal unpaid amount. Any attorney's fees or other costs incurred in collecting any delinquent amount shall be paid by the Client.
- 1.3 In the event that the Client requests termination of the work prior to completion of a report, Dames & Moore reserves the right to complete such analyses and records as are necessary to place its files in order and, where considered by it necessary to protect its professional reputation, to complete a report on the work performed to date. A termination charge to cover the cost thereof in an amount not to exceed 30% of all charges incurred up to the date of the stoppage of the work may, at the discretion of Dames & Moore, be made.

2.0 WARRANTY AND LIABILITY

- 2.1 Dames & Moore warrants that its services are performed, within the limits prescribed by its Clients, in a manner consistent with that level of care and skill ordinarily exercised by members of the same professions currently practicing in the same locality under similar conditions. No other warranty or representation, either expressed or implied, is included in its proposals, contracts or reports.
- 2.2 Dames & Moore has neither created nor contributed to the existence of any hazardous, radioactive, toxic or otherwise dangerous substance or condition at the site, and its compensation hereunder is in no way commensurate with the potential risk of injury or loss that may be caused by exposure to such substances or conditions. Accordingly, notwithstanding any other provision herein, the liability of Dames & Moore, its employees, subcontractors and agents for any injury or loss arising from any such pre-existing or client generated dangerous substance or condition at or near the project site, shall not exceed \$1,000.
- 2.3 Dames & Moore, its employees, subcontractors and agents shall not be liable for indirect or consequential damages, including without limitation loss of use and loss of profits.
- 2.4 In addition to the limitations provided in 2.2 and 2.3, and notwithstanding any other provision herein, the liability of Dames & Moore, its employees, subcontractors and agents shall be limited to injury or loss to the extent caused by the negligence of Dames & Moore, its subcontractors and/or agents hereunder, and the liability of Dames & Moore for injury or loss arising from (1) professional errors or omissions and/or (2) environmental impairment or pollution and/or (3) radiation, nuclear reaction, or radioactive substances or conditions shall not exceed \$5,000 or our fee, whichever is greater.
- 2.5 The liability of Dames & Moore, its employees, subcontractors and agents for any other claim(s) of any kind shall not exceed \$100,000.
- 2.6 Increased liability limits may be negotiated upon the Client's written request, prior to commencement of services, and agreement to pay an additional fee.
- 2.7 The Client agrees to indemnify and hold harmless Dames & Moore, its employees, subcontractors and agents against and from any claim, liability, attorneys' fees or other defense costs incurred because of (i) injury or loss caused by the actions or omissions of the Client, its employees or its other agents, contractors or subcontractors, or (ii) any third party claim arising from the performance of services hereunder by Dames & Moore, its agents or subcontractors, to the extent the liability and costs exceed the relevant amount of Dames & Moore's liability specified in sections 2.2-2.6 above and does not result solely from the negligence or willful misconduct of Dames & Moore, its agents or subcontractors.
- 2.8 In the event the Client makes a claim against Dames & Moore, at law or otherwise, for any alleged error, omission or other act arising out of the performance of its professional services, and to the extent the Client fails to prove such claim, then the Client shall pay all costs, including attorney's fees, incurred by Dames & Moore in defending itself against the claim.



REPORT
PHASE I ENVIRONMENTAL SITE ASSESSMENT
NEWPORT MARINA APARTMENTS
919 BAYSIDE DRIVE
NEWPORT BEACH, CALIFORNIA

PREPARED FOR:
STANDARD PACIFIC CORPORATION and NEWPORT MARINA LLC
URS/D&M JOB NO. 10554-003-015

December 8, 2000

URS/Dames & Moore
911 Wilshire Boulevard, Suite 800
Los Angeles, California 90017
(213) 996-2200

December 8, 2000

Mr. Gary Jones
Standard Pacific Corporation and Newport Marina LLC
15326 Alton Parkway
Irvine, California 92618

Re: Report
Phase I Environmental Site Assessment
Newport Marina Apartments
919 Bayside Drive
Newport Beach, California
URS/Dames & Moore Job No. 10554-003-015

Dear Mr. Jones:

Transmitted with this letter is one copy of our report entitled "Phase I Environmental Site Assessment" for the Newport Marina Apartments in the City of Newport Beach, Orange County, California. Thank you for the opportunity to be of assistance on this project.

We trust this report provides you with the information you require at this time. Should you have any questions regarding the information presented in this report, or need further assistance, please contact us.

Sincerely,
URS/DAMES & MOORE



Debra B. Stott
Senior Geologist

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1.0 INTRODUCTION

Presented in this report are the results of URS/Dames & Moore's Phase I Environmental Site Assessment (Phase I ESA) for the Newport Marina Apartments complex in the City of Newport Beach, Orange County, California (Figure 1). The approximately 4-acre subject property consists of approximately 81,000 square feet of residential apartments, divided into 64 units. A previous report has been used in the preparation of this report (Appendix A).

1.1 PURPOSE

The purpose of this Phase I ESA was to review past and present land use practices and site conditions to assess potential environmental impacts and to identify Recognized Environmental Conditions in connection with the subject property. By definition under ASTM designation E 1527, the term "Recognized Environmental Conditions" means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

1.2 SPECIAL TERMS AND CONDITIONS

The Scope of Services performed is in accordance with our proposal to Standard Pacific Corporation, dated August 18, 1999. The format and content of this Phase I ESA is in general accordance with the ASTM Standard Practice for Environmental Site Assessments: Phase I Site Assessment Process.

1.3 LIMITATIONS AND EXCEPTIONS OF THE ASSESSMENT

The conclusions presented in this report are professional opinions based solely upon indicated data described in this report, visual observations of the site and vicinity, and our interpretation of the available historical information and documents reviewed, as described in this report. The conclusions are intended exclusively for the purpose outlined herein and the site locations and project indicated. The Scope of Services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings, conclusions, or recommendations presented herein is at the sole risk of said user.

It should be recognized that this study was not intended to be a definitive investigation of contamination at the subject property and the recommendations provided are not necessarily inclusive of all the possible conditions. Given that the Scope of Services for this investigation was limited and that exploratory borings, soil and/or groundwater sampling were not undertaken, it is possible that currently unrecognized contamination may exist at the site.

Opinions and recommendations presented herein apply to the site conditions existing at the time of our investigations and cannot necessarily apply to site changes of which URS/Dames & Moore is not aware and has not had the opportunity to evaluate. Changes in the conditions of this property may occur with time due to natural processes or the works of man on the subject site or adjacent properties. Changes in applicable standards may also occur as a result of legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond our control.

1.4 LIMITING CONDITIONS AND METHODOLOGY USED

This assessment was accomplished by, and limited to, a site reconnaissance, a drive-by survey of the site vicinity, and a review of available pertinent documentation available through URS/Dames & Moore's standard resources regarding past and current land use for indications of the manufacture, generation, use, storage and/or disposal of hazardous

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EXECUTIVE SUMMARY

Presented in this report are the results of URS/Dames & Moore's Phase I Environmental Site Assessment (Phase I ESA) for the Newport Marina Apartments complex in the City of Newport Beach, Orange County, California. This assessment was accomplished by, and limited to, a site reconnaissance, a drive-by survey of the site vicinity, and a review of available pertinent documentation available through URS/Dames & Moore's standard resources regarding past and current land use for indications of the manufacture, generation, use, storage and/or disposal of hazardous substances at the site. Information from previous reports has been used in the assessment of this property.

The Scope of Services performed is in accordance with our proposal to Standard Pacific Corporation, dated August 18, 2000. The format and content of this Phase I ESA is in general accordance with the ASTM Standard Practice for Environmental Site Assessments: Phase I Site Assessment Process E-1527.

The subject property is located on the south side of Bayside Drive, in between Jamboree Road and Promontory Drive in the City of Newport Beach, Orange County, California. The specific site address is 919 Bayside Drive. The site vicinity consists of residential and commercial properties. The approximately 4 acre property consists of 64 residential apartments, covered and uncovered asphalt paved parking spaces, a swimming pool, landscaped areas, and boat docks.

No evidence of manufacturing involving the use or storage of hazardous materials was observed at the subject properties. The subject property was not identified on agency database lists of known or potential hazardous waste sites, landfills, or sites under investigation for known or potential environmental violations.

The historical data reviewed dates back to 1947, when the site was shown on an aerial photograph as an undeveloped sandy beach. The subject property appeared to be undeveloped land until 1959 when the first 50 apartment units were constructed. The additional 14 apartment units were completed between 1973 and 1976.

A number of sites in the vicinity of the subject property are included on agency environmental database lists. Based on a review of EDR agency lists, the listed sites are not expected to have adversely affected the subject property.

Based on the Scope of Services performed for this Phase I ESA, recognized environmental conditions were not identified at the subject property due to current or past onsite operations. Based on the results of the Phase I ESA of the subject property, no further investigation of the subject property appears warranted at this time.

substances at the site. To meet the objective of this assessment, URS/Dames & Moore completed the following tasks:

- Performed a reconnaissance survey of the subject property to make visual observations of existing site conditions and activities, and a drive-by survey of the area within ¼-mile of the site to observe types of general land use within the search area.
- Conducted interviews with site personnel to evaluate the site history, and operation and maintenance procedures.
- Reviewed the federal, state, and local database list search provided by Environmental Data Resource, Inc., (EDR) of known or potential hazardous waste sites or landfills, and sites currently under investigation for environmental violations. The agency lists and search radii are provided in Appendix B.
- Conducted inquiries in person, by telephone, or in writing to the appropriate regulatory agencies for information regarding environmental permits, violations or incidents, and/or the status of enforcement actions at the subject property.
- Reviewed previous environmental reports.
- Prepared this report describing the research performed and presenting URS/Dames & Moore's findings and professional opinions regarding the potential for adverse environmental impacts to the subject site.

2.0 SITE DESCRIPTION

2.1 LOCATION

The subject property is located on the south side of Bayside Drive, in between Jamboree Road and Promontory Drive in the City of Newport Beach, Orange County, California. The specific site address is 919 Bayside Drive. The site vicinity consists of residential and commercial properties.

2.2 SITE RECONNAISSANCE & INTERVIEWS

On November 21, 2000, Ms. Natalia Elmanovitch, a URS/Dames & Moore representative, conducted a reconnaissance of the subject property. The reconnaissance consisted of the observation and documentation of existing site conditions and nature of the neighboring property development within ¼ mile of the site.

The approximately 4 acre property consists of 64 residential apartments, covered and uncovered asphalt paved parking spaces, a swimming pool, landscaped areas, and boat docks. Interviews were conducted with Ms. Kathleen Gatchell, property manager from Western National Property Management, and Mr. Peter Ruiz, site engineer. Ms. Gatchell has worked at the subject site for approximately three months, and Mr. Ruiz has worked at the site for three years.

2.2.1 Hazardous Substances

No significant use or storage of hazardous or regulated substances was observed onsite. Indications of environmental permits for use or disposal of hazardous substances or wastes were not found for current or past uses of the subject property.

Household quantities (less than 1 gallon) of various cleaners and other maintenance materials (paints, etc.) were observed in several janitorial and maintenance storage areas. In addition, five gallons of chlorine were observed in a 5-gallon container in the pool equipment room.

2.2.2 Storage Tanks

Evidence of underground storage tanks (vent lines, fill or overfill ports, fuel pumps) was not observed. No aboveground storage tanks were observed at the time of the site visit. No indication of the past presence of aboveground or underground storage tanks was found.

2.2.3 Polychlorinated Biphenyls (PCBs)

Several pad-mounted transformers and underground utility vaults owned and maintained by Southern California Edison (SCE) were observed throughout the subject property. SCE stated that their transformers are cooled with mineral oil and do not contain PCBs.

2.2.4 Waste Disposal

Several garbage dumpsters were observed within trash enclosures at the subject site. Municipal waste is removed from the subject property by CR&R Recycling and Refuse Service on a regular basis. The dumpster areas appeared to be well maintained. No evidence of staining or unusual odors were noted. According to Mr. Ruiz, no waste oil or other hazardous materials are stored on the boat docks, and no hazardous waste is generated onsite. Boat owners are allowed to have their boats serviced onsite. However, these operations are conducted by outside contractors and all generated materials (used oil, etc.) are removed from the site at the time of the service.

2.2.5 Wetlands, Floodplain, Coastal Zone

Wetlands were not observed on or adjacent to the subject properties. The property is adjacent to Newport Harbor.

2.2.6 Drums/other Chemical Containers

Drums and chemical containers were not observed onsite.

2.2.7 Dumping

Evidence of dumping was not observed onsite.

2.2.8 Pits, Ponds, Lagoons, Septic Systems, Cisterns, Sumps, Drains

Pits, ponds, lagoons, septic systems, cisterns, and sumps were not observed at the site. Several drains connected to the City of Newport Beach sewers were observed throughout the property. Staining or other evidence of contamination was not noted in the vicinity of the storm drains.

2.2.9 Pesticide Use

No pesticide use was observed onsite.

2.2.10 Staining and Discolored Soils

Discolored soils and staining were not observed onsite.

2.2.11 Stressed Vegetation

Stressed vegetation was not observed onsite.

2.2.12 Unusual Odors

Unusual odors were not detected onsite.

2.2.13 Onsite Wells

No monitor, water supply, or oil and gas production wells were observed or reported onsite.

2.2.14 Nearby Environmentally Sensitive Sites

No environmentally sensitive sites were observed within ¼ mile of the subject properties.

2.2.15 Other Concerns

No other environmental concerns were observed or reported during the site reconnaissance.

2.3 CURRENT USES OF ADJACENT PROPERTY

The sites are located within an area that primarily consist of residential and commercial properties in the City of Newport Beach, California (Figure 2). In general, prominent adjoining land uses are as follows:

- North: Across Bayside Drive are the Promontory Point Villa Apartments, a restaurant, a Pavilions Grocery Store, and a retail shopping center.
- South: Adjacent to the southern portion of the subject property are boat docks, beyond which is the Beacon Bay portion of the Newport Harbor.
- East: Adjacent to the east are residential condominiums.
- West: Adjacent to the west is a channel of the harbor, beyond which are the Balboa Yacht Basin, the Galley Cafe, and residential homes.

2.4 HISTORICAL USE

Dames & Moore performed a Phase I ESA at the subject property in October of 1999. During the 1999 investigation, Dames & Moore conducted personal interviews and reviewed selected historical aerial photographs for the subject property. The aerial photographs were reviewed for evidence of activities which would suggest the potential presence of hazardous substances at the site and to evaluate the potential for the site to be impacted by offsite sources of contamination. Sanborn Mapping and Geographic Service does not provide coverage for the subject property. The following sections provide a summary of the review.

2.4.1 Aerial Photographs

Aerial photographic images were obtained from Environmental Data Resources (EDR) from Southport, Connecticut, with coverage of the subject properties from 1947, 1954, 1968, 1977, 1989, and 1994.

- 1947 According to the aerial photograph from this year, the subject property appeared to be a vacant beach. Along the southern boundary of the property were boat docks along the channel of the Newport Harbor. On the other side of the harbor channel, further to the south, was Balboa Island with residential homes. To the north of the site was Bayside Drive, beyond which was more undeveloped land. Adjacent to the east of the site was more undeveloped beach property. Approximately 1/8 mile to the east were two structures, beyond which was Jamboree Road. Adjacent to the west was a drainage channel, beyond which was the Balboa Yacht Basin and more boat docks.
- 1954 The subject property and the vicinity in this photograph appear to be unchanged. Several properties to the east of the site, along the drainage channel, appear to be under development.
- 1968 According to the aerial photograph, the subject property appears to be developed with residential apartments. According to site personnel, only 50 apartment units were completed at this time. To the north across Bayside Drive was a large commercial shopping center, in the same orientation as the current Pavilions Grocery store and adjacent shopping stores. Adjacent to the east, residential condominiums were also developed. The remainder of the vicinity appeared unchanged.
- 1977 According to the aerial photograph, the remainder of the northern portion of the subject property was further developed, and the subject property appeared as it does today. According to site personnel, an additional 14 apartment units were added in the mid-1970s. Across Bayside Drive to the north, the Promontory Point Villa Apartments were developed. Adjacent to the west, an additional, concrete lined harbor channel was developed in the location of the former drainage channel.

1989 The aerial photograph from this year depicts the subject property and vicinity as they appear today. The Balboa Yacht Basin appears to have been renovated to accommodate more boats in the boat dock area.

1994 The subject property and vicinity appear unchanged.

2.4.2 City of Newport Beach Historical Information

During the 1999 Phase I ESA, Dames & Moore reviewed available files at both the City of Newport Beach Building & Planning Department and the City of Newport Beach Fire Department. The files were reviewed for evidence of activities which would suggest the potential presence or former presence of hazardous substances or contamination at the site.

According to the available files, the subject property was originally developed in 1959 for the Volk-McLain Company, and additions were completed between 1973 and 1976 for the McLain Development Company. Site personnel confirmed that originally 50 apartment units were constructed in 1959, and an additional 14 units were constructed in the mid-1970s. The rental office and storage rooms were added to the property in 1983, and other tenant improvements were completed in 1993.

3.0 RECORDS REVIEW

URS/Dames & Moore reviewed readily available records regarding past and current site use, contacted applicable agencies regarding environmental concerns at the site, and reviewed the agency database list search for environmental concerns at surrounding properties. The information obtained during the records review is provided in the following sections.

3.1 AGENCY RECORD REVIEW

3.1.1 Database List Search

URS/Dames & Moore contracted Environmental Data Resource, Inc., (EDR) to provide a review of the publicly available federal, state, and local databases of known or potential hazardous waste sites or landfills and sites currently under investigation for environmental violations for the site address and the surrounding area. The EDR-Radius Map Report along with descriptions of each federal, state, and local lists are included in Appendix B. Facilities located adjacent to or hydraulically up-gradient from the site with respect to the inferred southerly groundwater flow direction, are discussed below.

EDR-listed properties interpreted as hydraulically downgradient or cross-gradient from the site relative to groundwater flow direction are in our opinion unlikely to impact the site with hazardous materials and are therefore excluded from the following discussion.

3.1.1.1 Site

The subject property was not listed in the database search.

3.1.1.2 Offsite

Federal (NPL) or State (SPL) Superfund listings were not identified within 1-mile of the site. No Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site were identified within ½-mile of the subject property. No Federal Resource Conservation & Recovery Act (RCRA) Corrective Action (CORRACTS) sites were identified within one mile of the subject site. No RCRA Transfer, Storage, or Disposal (TSD) facilities were identified within ½-mile of the site. No California Department of Toxic Substances Control Potentially Hazardous (Cal-Sites) facilities identified within one mile of the subject property. Twelve California Hazardous Material Incident Report System (CHMIRS) sites were identified within one mile of the subject site. Eight sites identified by the California Environmental Protection agency as potentially toxic material (CORTESE sites) were identified within a ½ mile radius of the subject property. No Integrated Waste Management Board's Solid Waste Information System (SWIS) database of Solid Waste Facilities/Landfill (SWF/LF) Sites were identified within ½ mile of the subject property. Eight leaking underground storage tank

(LUST) sites were listed within ½-mile of the site and one registered UST facility was identified within ¼-mile of the site. No RCRA Small or Large Quantity Generator (SQG or LQG) sites were identified within ¼ mile of the subject property. One facility listed on the California Spills, Leaks and Investigative Cleanup (SLIC) database was identified within ½ mile from the subject property.

Five sites located within ¼ mile from the subject property were identified on the Hazardous Waste Information System (HAZNET) database. This database contains data extracted from hazardous waste manifests. The HAZNET listing alone is not expected to have an impact on the subject property. Therefore, the sites listed solely on HAZNET database are excluded from the following discussion.

The following is a summary of information provided in the EDR-Radius Map Report regarding sites located adjacent to or up-gradient of the subject property. The location of these sites is shown on the radius maps accompanying the EDR report in Appendix B. Numbers in parentheses in the following paragraphs refer to the map identification number in the EDR maps and report.

- Bayside Cleaners (B4) is located at 1056 Bayside Drive, approximately 1/8 mile to the east of the subject property. This facility is identified on the CA SLIC database for a tetrachloroethylene (PCE) release that affected soil only. The database listed this facility under the "closed" status. Based on the regulatory status, cross-gradient location, and media affected by the release (soil), it is URS/Dames & Moore's opinion that the potential for this facility to have impacted the subject property is low.
- An unnamed property located at 301 East Coast Highway (C5) is listed on the CHMIRS database for an unauthorized release of contaminated water into the ground. This property is located approximately 1/6 mile to the northwest of the subject property. Based on the distance from the subject site and the substance released, it is URS/Dames & Moore's opinion that this facility is unlikely to have impacted the subject property.
- Robert Wayne Morgan/Mobil Service Station #18 (D6-10) is located at 1000 East Coast Highway, approximately 900 feet to the north of the subject property. This facility is identified on the UST database for three gasoline and one waste oil USTs. The LUST database identifies this site for a gasoline leak that affected groundwater.

“Signed off, remedial action completed or deemed unnecessary” status is indicated on the database. Based on the remedial status and distance from the subject property, it is URS/Dames & Moore’s opinion that this facility is not expected to have created a recognized environmental condition on the subject property.

- Shell Service Station (E11-E12) was located at 990 Pacific Coast Highway, approximately 960 feet to the northeast of the subject property. This facility is listed in the CORTESE and LUST databases. In 1992, a release of gasoline is reported to have impacted local groundwater. A remediation plan is reported to have been developed, but no current status is reported. Based on the cross-gradient location and distance from the subject property, it is the opinion of URS/Dames & Moore that the potential for this site to have impacted the subject property is low.
- Newport Imports (13) is located at 1200 Pacific Coast Highway, approximately ¼ mile to the east-northeast of the subject property. This facility is included in the LUST database for a release of waste oil into groundwater. Remedial activities were conducted, and the case was closed in 1994. Based on the remedial status of this site and the distance from the subject property, it is the opinion of URS/Dames & Moore that the potential for this site to impact the subject property is low.
- Newport Beach Cars LLC (17) is located at 455 East Pacific Coast Highway, approximately ½ mile to the northwest of the subject property. The facility is identified on the LUST database for a waste oil leak that affected groundwater. “Remedial plan developed” status is indicated on the database. The UST database lists this facility as operating eight USTs containing gasoline and waste oil. Based on the distance of this facility from the subject property and the cross-gradient location, it is URS/Dames & Moore’s opinion that the potential for this facility to have created a recognized environmental condition on the subject property is low.

Other facilities listed on the EDR report are not expected to have impacted the subject property due to their distance from the subject site, cross- to downgradient location, and/or case closed status. The Orphan Summary list was reviewed for facilities located in close proximity to or upgradient of the subject property within the search radii. Based on the distance from the subject property, it is URS/Dames & Moore’s opinion that the potential for these facilities to have impacted the subject property is low.

3.1.2 Agency Contacts

During the 1999 Phase I ESA, Dames & Moore contacted state and local regulatory agencies to obtain information regarding the environmental condition of the subject property. The following information was received from these agencies:

- Based on a letter dated October 18, 1999, from the State of California Environmental Protection Agency, Department of Toxic Substances Control, there are no records for the subject property.
- Based on a letter dated October 19, 1999, from the South Coast Air Quality Management District, there were no records found for the subject property.
- Based on a letter dated October 25, 1999, from the County of Orange Health Care Agency, no records for the subject property were found.
- According to a telephone conversation with a representative from the California Regional Water Quality Control Board, Santa Ana Region, there are no records for the subject property.
- According to a letter dated October 13, 1999, the State of California Fire Marshal's Office stated that there were no pipelines located on the subject property.

Based on the fact that the use of the subject property has not changed since the 1999 Phase I ESA and the lack of listing on the current database search (See Section 3.1.1.1), agencies referenced above are not expected to have additional records for the subject property, and therefore, were not contacted during this investigation.

3.2 PHYSICAL SETTING

URS/Dames & Moore reviewed pertinent maps and readily available literature for information on the physiography and hydrogeology of the site. A summary of this information is presented in the following subsections.

3.2.1 Topography

The subject property is located in Township 6 South, Range 10 West, Section 35, within the City of Newport Beach, Orange County, California. Topographic map coverage of the site vicinity is provided by the U.S. Geologic Survey (USGS), 7.5 minute "Newport Beach, California" quadrangle (1965, photo revised 1981). The elevation of the subject properties is approximately 10 feet above mean sea level (MSL). The subject property is bounded by Beacon Bay to the south.

3.2.2 Geology and Hydrogeology

The subject property is located within the Coastal Plan of the Orange County Basin, which is underlain by a deep structural depression containing primarily of Middle Miocene sedimentary rocks. The rapid rate of deposition of the rock units, accompanied by folding and faulting, has resulted in marked lateral variations in the thickness and lithology encountered in the subsurface. The deposits have been reported to be hybrid marine and continental units; at the site the surface geology is mapped as alluvium, beach sand, and artificial fill comprised of unconsolidated and poorly consolidated gravel, sand, and silt (DWR, 1967).

The Newport-Inglewood uplift is a major regional feature extending 42 miles in a northwest-southeast direction from Beverly Hills in Los Angeles County through Newport Beach in Orange County. Rocks generally dip downward toward the ocean and landward from the axis of this faulted, anticlinal feature. The surface expression of the uplifted belt is an alignment of low hills and coastal mesas, transected by several gaps. The landforms represent a deformed Pleistocene surface, and the gaps are erosional features (DWR, 1967).

The water-bearing deposits in Orange County are, for the most part, unconsolidated or semiconsolidated alluvial sediments that are Quaternary or Tertiary in age (DWR, 1967). Specific site hydrogeology is not available. However, based on the proximity of the property to the Newport Harbor, it can be assumed that water would be encountered within the first 5 to 10 feet below the ground surface. Based on the local topography, the groundwater is expected to flow in a southerly direction.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the Scope of Services performed for this Phase I ESA, recognized environmental conditions were not identified at the subject property due to current or past onsite operations. Additionally, no sites in the surrounding area were identified with the potential to impact the subject property. Based on the results of the Phase I ESA of the subject property, no further investigation of the subject property appears warranted at this time.

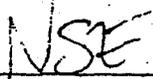
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5.0 PREPARER SIGNATURES

The signatures of the individuals who prepared this report are provided below.



Debra B. Stott _____
Senior Geologist



Natalia S. Elmanovitch _____
Staff Geologist

REFERENCES

- California Environmental Protection Agency, Department of Toxic Substances Control, letter dated October 18, 1999.
- California Regional Water Quality Control Board, Santa Ana Region, telephone communication, October 13, 1999.
- California Department of Water Resources (DWR), "Progress Report on Ground Water Geology of the Coastal Plain of Orange County," July 1967.
- City of Newport Beach Department of Building & Planning, agency visit, October 13, 1999.
- City of Newport Beach Fire Department, agency visit, October 13, 1999.
- County of Orange Health Care Agency, letter dated October 25, 1999.
- Environmental Data Resources, Inc. (EDR), "The EDR-Radius Map Report: Bayside Apartments," Inquiry Number 1567148.1p, November 22, 2000.
- Environmental Data Resources, Inc. (EDR), "The EDR-Aerial Photography Print Service: Bayside Apartments," Inquiry Number 420081-8, October 13, 1999.
- Environmental Protection Agency, Region 9, Sole Source Aquifer Map, January 1998.
- Dames & Moore, Phase I Environmental Site Assessment, Newport Marina Apartments, 919 Bayside Drive, Newport Beach, California, October 25, 1999.
- Munger Map Book of California and Alaska Oil and Gas Fields, 1997 edition.
- South Coast Air Quality Management District, letter dated October 19, 1999.
- United States Geological Survey (USGS), "Newport Beach, California" Quadrangle, 7.5 minute map, 1965, (photo revised 1981).

WATER QUALITY MANAGEMENT PLAN (WQMP)

FOR

TENTATIVE TRACT

MAP NO. 15323

**Site Development Permit
PA 2004 - 072**

Prepared For:

**Coastal Farms Real Estates, LLC.
537 Newport Center Drive
Newport Beach, CA 92660**

Prepared By:



ADAMS • STREETER
CIVIL ENGINEERS, INC.
15 Corporate Park, Irvine, CA 92606
Ph:949-474-2330 Fax:949-474-0251

DATE PREPARED: September 2004

JN 03-1491

**OWNER'S CERTIFICATION
WATER QUALITY MANAGEMENT PLAN
SITE DEVELOPMENT PERMIT PA 2004-072**

This Water Quality Management Plan (WQMP) has been prepared for Coastal Farms Real Estates, Inc. It is intended to comply with the City of Newport Beach Tentative Tract Map 15323 submittal; requiring the preparation of a Water Quality Management Plan (WQMP).

The undersigned is aware that Best Management Practices (BMPs) are enforceable pursuant to the City's Local Implementation Plan Section. The undersigned, while Owner of the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with:

1. The current Orange County Drainage Area Management Plan (DAMP); and
2. The intent of the non-point source National Pollution Discharge Elimination System (NPDES) Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District, and the incorporated cities of Orange County within the Santa Ana Region Stormwater Runoff Management Program.

Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved-signed copies of this document shall be available on the subject site in perpetuity.

By: _____
Name: Thom Utman
Title: _____
Company: Coastal Farms Real Estates, LLC.
Address: 537 Newport Center Drive
Newport Beach, California 92660
Telephone: (949) 275 - 1858
Date: _____

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 The Ocean Begins at Your Front Door

 When it Rains, It Drains

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 Common Contributors to Storm Water Pollution

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 Recycling Prescription for Living

 The Solution is to Recycle

 Storm Drains are for Rain – They’re Not Recycling Centers

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Inlet Cleaning
Spot Cleaning
What's the Scoop
Catch Basin Cleaning (SC71 of California Storm Water BMP Handbook, 1993)
Housekeeping Practices (SC10 of California Storm Water BMP Handbook, 1993)
Building & Grounds Maintenance (SC11 of California Storm Water BMP Handbook, 1993)

E. GENERAL BUSINESS PROCEDURES/BMPs

Your Business and the County Partners in Protecting the Ocean
Good Cleaning Practices
Quick Reference Table of Disposable Alternatives
Spill Prevention and Control (CA12 of California Storm Water BMP Handbook)
Best Management Practices for Industrial Storm Water Pollution Control
Employee Training (SC14 of California Storm Water BMP Handbook)

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Blueprint for a Clean Ocean
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Storm Drains are for Rain – Not Pesticides
Storm Drains are for Rain – Not Fertilizer
Preventing Pollution Through Efficient Water Use
Management Guidelines for Use of Fertilizers and Pesticides
Twenty Ways to Protect Your Water
Healthy Lawn Healthy Environment
Citizen's Guide to Pest Control & Pesticide Safety
Model Water Efficient Landscape Ordinance

H. AMENDMENTS

I. DISCRETIONARY PERMIT & WATER QUALITY CONDITION

A. Discretionary Permit & Water Quality Condition

This WQMP report is intended to satisfy Site Development Permit PA 2004 - 072 as indicated in the application specifically:

Submittal of a preliminary/conceptual Water Quality Management Plan (WQMP) prepared in accordance with the City of Newport Beach Local Storm Water Implementation Plan and the Drainage Area Master Plan (DAMP) and shall submit the WQMP for review to the City. The City shall approve the WQMP prior to the grading of the precise grading permit for the proposed development. In accordance with the DAMP, the WQMP shall: 1) describe the routine and special post-construction BMPs to be used at the proposed development site (including both structural and non-structural measures); 2) describe responsibility for the initial implementation and long-term maintenance of the BMPs; 3) provide narrative with the graphic materials as necessary to specify the locations of the structural BMPs; and, 4) certify that the project proponent will seek to have the WQMP carried out by all future successors or assigns to the property. Detailed information about process for identifying BMPs is included in the Water Quality Assessment Technical Appendix.

B. Regulatory Requirements

With regard to surface water quality, the proposed TENTATIVE TRACT MAP 15323, is subject to the requirements of the U.S. Environmental Protection Agency ("EPA"), the California State Water Resources Control Board ("State Board"), the California Regional Water Quality Control Board-Santa Ana Region ("Regional Board"), the County of Orange ("the County"), and the City of New Port Beach ("the City"). The following sections briefly describe the regulatory framework that guides this WQMP.

General requirements are shown in the following table and discussed in more detail below.

Water Quality Requirement	Enforcing Agency
Clean Water Act	EPA but largely delegated to the SWRCB and RWQCB.
National Pollutant Discharge Elimination System Permit	California State Water Resources Control Board (SWRCB)
Municipal Separate Storm Sewer System Permit (MS4) ¹	Regional Water Quality Control Board (RWQCB)
Drainage Area Management Plan, Appendix G	County of Orange

¹ California Regional Water Quality Control Board, Santa Ana Region, Order No. 2002-0010 NPDES No. CAS618030, Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and The Incorporated Cities of Orange County Within the Santa Ana Areawide Urban Storm Water Run-off Orange County

The federal Clean Water Act (33 U.S.C. §§121 et seq.) is the principal federal statute governing water quality. The goals of the Clean Water Act is to protect the physical, chemical, and biological integrity of the waters of the United States. The Clean Water Act requires the State to adopt water quality standards for water bodies and have those standards approved by EPA. The State agencies that set water quality standards in California are the SWRCB and the RWQCB's that are under the SWRCB's purview. Water quality standards consist of a designated beneficial use or uses for a particular water body, along with water quality objectives based upon these uses (40 C.F.R. §131.3(i)). Designated beneficial uses of water bodies describe the appropriate uses of that water body, such as contact recreation, warm water habitat, and municipal or drinking water uses. Water quality objectives are limits or levels of water pollutants and/or narrative statements, which represent the quality of water that support a particular use. Water quality criteria (objectives) are contained in the Basin Plan² developed by the Regional Board.

Under the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) permits require effluent limits necessary to meet water quality standards for pollutants that may cause or contribute to exceeding a State Water Quality Standard. (40 C.F.R. §122.44.) NPDES permits may establish enforceable effluent limitations on discharges, require monitoring of discharges, designate reporting requirements, or require the permittee to perform best management practices ("BMPs"). BMPs are procedures designed to minimize the release of pollutants. BMP may be used in addition to numeric effluent limitations or, in some cases, in lieu of numeric effluent limitations. (40 C.F.R. §122.44(k).) When application of numeric effluent limitations is technically unfeasible, such as in permits governing storm water discharges, effluent limitations are expressed as BMPs.

The MS4 (Order No. 2002-0010) is the NPDES permit governing storm water discharges and certain non-storm water discharges to the public storm drain system within the North Orange County jurisdiction of the Santa Ana RWQCB. The MS4 Permit relies primarily on the Orange County Drainage Area Management Plan (DAMP), which sets forth BMPs and other water quality control measures to manage water quality for storm water discharges to the municipal storm drain system. The DAMP is administered by Orange County and numerous co-permittees, and the Santa Ana RWQCB has determined that compliance with the DAMP (as it will be modified pursuant to the MS4 Permit) meets the permitting requirements of the MS4. The DAMP is the principal policy and guidance document for the countywide NPDES Stormwater Program, and is designed to achieve compliance with Basin Plan² standards through BMP's. The DAMP contains New Development BMPs as well as other applicable programs, such as fertilizer management and efficient irrigation programs. Additionally, the DAMP requires preparation of this WQMP (project-specific plan) in connection

with new development projects. The WQMP addresses post-construction, long-term water quality management.

² "Water Quality Control Plan Santa Ana River Basin" dated 1995, prepared by the California Regional Water Quality Control Board Santa Ana Region.

II. PROJECT DESCRIPTION

Tentative Tract Map 15323 will be developed to accommodate 19 costume residential lots and a community pool. The community will be gated with privately maintained streets and storm drainage. Currently, this development is situated on the south side of Bayside Drive west of Jamboree Road which are existing apartments known as "The Newport Marina Apartments"). The entire south and west side of the property is elevated and is being retained by a sea wall (bulkhead).

The developed condition of this site will implement a privately maintained storm drain system. This system will consist of drop inlets, catch basins and underground Reinforced Concrete Pipes (RCP) to convey storm run-off through the private street. When developed, the site will create 20 pads. Drainage in these pads will be developed by the homeowner and will be connected to the provided storm drain stubs. Each lot will be rough graded and will drain via surface flow into a drop inlet within the street gutter. Each property owner will maintain their drainage system and landscaping on their Estate Parcel. Any flows entering the private street will be captured by catch basins which will also be connected directly to the storm drain system.

This storm drain system will eventually connect to the existing 36" RCP which runs parallel with the east property line and located within its own 20' easement. This system will employ a "First Flow" filter system prior to its connection onto the public 36" RCP.

III. SITE DESCRIPTION

The undeveloped condition of the site (currently developed as apartments) contains approximately 20% pervious areas. The site seems to indicate a split drainage patterns of the northern and southern portion. The northern portion of the site drains towards Bayside Drive through the use of catch basins and inlets within the parking areas which then drain to the 36" RCP that runs under the sidewalk along Bayside Drive. The tributary areas within the northeast portion of the site drain via surface flow out onto Bayside Drive directly. This run-off gets captured by the same basin mentioned above. (According to 36" A.C.P. Storm Drain improvement plans of Bayside Drive obtained from city records – Tract # 3867).

The southern portion of the site is divided into 5 sections; of which each is collected

via drains through a series of pipe network and eventually drains directly onto North Bay Front via outlets through the bulkhead (refer to Outlet Exhibit in section VI).

The proposed condition (Single Family Residential) will be developed with approximately 5 dwelling units per acre which equates to 50% pervious areas. Ultimately, this 30% increase in pervious areas should not increase the run-off with the development of this site

IV. BEST MANAGEMENT PRACTICES (BMPs)

This section discusses the BMPs identified for this project to control predictable non-point source pollutant runoff and to identify "routine" structural and non-structural measures as specified in the Countywide NPDES Storm Water Program Drainage Area Management Plan, April 1993, Appendix G. Also included herein are matrices taken from Appendix G listing Non-Structural BMPs and Structural BMPs and indicating the type of development for which each of the BMPs are applicable. The BMPs presented in this report are categorized as follows:

- Structural BMPs – engineered facilities designed to function with and compliment the project drainage system and address treatment of urban pollutant problems.
- Non-structural BMPs – consist of educational programs, management practices, and regulatory approached aimed at reducing pollutants in runoff entering storm drain systems that drain to the ocean.
- Special BMPs – structural BMPs over and above the "routine" Structural BMPs listed in the DAMP, designed to function with and compliment the project drainage system and address treatment of urban runoff pollutant problems. There are no special BMPs within the tract boundary.

Landscape areas designated in Tentative Tract Map 15323 are part of lettered lot "A" and will be maintained by Homeowners Association. Other landscape areas within the private lots will be maintained by each property owner. The landscape areas will help in filtration of runoff waters prior to discharge to storm drain system. Structural BMPs S1, S2, and S3 will apply to this area.

A. STRUCTURAL BMPs

S1 Filtration

Landscape areas will be provided to allow filtration of runoff waters prior to discharge to the storm drain system. Landscape areas shall be designed with the intention of bio-filtering as much as possible given the availability of landscaped open space and slopes. Homeowner landscaping shall be designed also with the intent of bio-filtering to remove pollutants and sediments during the first-flush to

avoid depositing in the storm drain systems and receiving bodies of water. These water quality features are in addition to the BMP measures of Planning Area 9.

S2 Area Efficient Irrigation

Irrigation systems shall be installed with state-of-the practice controllers that are programmed to apply the proper volume of water and to control the watering frequency to avoid excess runoff. These evapotranspiration (ET) controllers are currently available and are used for large landscape areas such as school playing fields, parks, etc., and are designed to regulate irrigation needs based on atmospheric conditions. The Irvine Ranch Water District is currently researching/testing the viability of a lower cost ET controller for individual residences, which would be regulated by a remote paging signal. Depending on the results of this research, a program to regulate irrigation of the landscape areas of individual residences could be implemented within the next few years. A Landscape and Irrigation Management Plan shall be implemented and, with respect to irrigation, the Plan shall verify the following at a minimum:

- Rain sensors are functioning properly (make adjustments as necessary).
- Irrigation heads are adjusted properly to eliminate over-spray to hardscape areas.
- Irrigation timing and cycle lengths are adjusted in accordance with water demands, time of year, weather, and day or nighttime temperatures.
- Plants with similar water requirements are grouped together (BMP S3).

These systems will be designed and operated based on the requirements of the following documents:

- City of Newport Beach Water District Procedural Guidelines and Design Requirements for Reclaimed Water.
- Table 4 – Post Development Structural BMPs Maintenance Responsibility/Frequency Matrix.
- Table 5 – Post Development Non – Structural BMPs Maintenance Responsibility / Frequency Matrix

S3 Runoff – Minimizing Landscape

As indicated in BMP S2, a Landscape and Irrigation Management Plan shall be implemented for the site. With respect to landscaping, the Plan shall, at a minimum, verify the following:

- Plants shall be grouped in accordance with their watering needs in order to avoid potential overwatering, which may lead to irrigation runoff.
- Plants should be grouped in accordance with their need for supplemental fertilizers in order to avoid over-fertilization of an entire area to meet the higher need of a few plants.
- Landscaping shall be maintained in a neat, clean and healthful condition.

The Landscape and Irrigation Management Plan shall be implemented in accordance with Table 4 – Post Development Structural BMP Maintenance Responsibility/Frequency Matrix.

S13 Catch Basin

The phrase “NO DUMPING – DRAINS TO OCEAN” or equally effective phrase shall be stenciled on all catch basins to alert the public to the destination of pollutants discharged into the storm drain system. Maintenance of the stenciling shall be conducted in accordance to Table 4 – Post Development Structural BMP Maintenance Responsibility/Frequency Matrix.

TABLE 2: STRUCTURAL BMPs

APPROPRIATE STRUCTURAL BMPs	RESIDENTIAL	INDUSTRIAL	RETAIL/OFFICE CENTER	RESTAURANTS WAREHOUSE GROCERY	FUEL DISPENSING	VEHICLE REPAIR MAINTENANCE
Filtration (S1)	X	X	X	X		
Efficient Irrigation (S2)	X	X	X			
Runoff – Minimizing Landscape (S3)	X	X	X			
Community Car Wash Racks (S4)						X
Wash Water Controls for Food Preparation Areas (S5)				X		
Trash Container (Dumpster Area (S6)		X		X	X	X
Self-Contained Areas for Washing/ Steam Cleaning/Repair/ Mat. Processing (S7)		X				X
Outdoor Storage (S8)		X				
Concrete Fuel Dispensing Areas (S9)					X	
Extended Fuel Dock Canopy (S10)					X	
Inlet Flow From Motor Fuel Dispensing Areas (S11)					X	
Energy Dissipaters (S12)		X	X			
Catch Basin Stenciling (S13)	X	X	X			
Diversion of Loading Dock Drainage (S14)				X		
Inlet Trash Racks (S15)	X	X	X			
Water Quality Inlets (S16)		X		X	X	X

BMPs circled are those applicable to the project site.

B. NON-STRUCTURAL BMPs

N1 Education for Property Owners

Practical information material will be provided to residents and tenants by the homeowners associations and property managers on general good housekeeping practices for each type of site occupancy that contribute to protection of storm water quality. Such information will include, but not be limited to, the attachments provided at the end of this report. In addition to the attachments, the following resource can be contacted to obtain updated educational information and ordinances free of charge:

- American Oceans website – www.americanoseans.org/runoff/epa-bro.htm. This website provides a listing of the brochures available from various State of California, County and City agencies. The telephone numbers of each of the agencies are also provided on this website.
- City of Irvine.
- Orange County Flood Control District, Water Quality Management Section.

N2 Activity Restrictions

In conjunction with formation of a homeowners association (HOA), conditions, covenants, and restrictions shall be prepared by the developer for the purpose of surface water quality protection.

N3 Landscape Management

Management of landscaped areas shall be performed consistent with the following:

- “Management Guidelines for Use of Fertilizers and Pesticides” (attached in the Appendix);
- Items discussed in Structural BMPs S2 and S3; and
- The inspection and maintenance activities outlined in this WQMP and in Tables 4, 5 and 6.

N4 BMP Maintenance

The following tables constitute BMP N4 and list the responsible parties for implementation of each BMPs listed herein and provide a schedule of frequency for maintaining the BMPs:

- Table 4 – Post Development Structural BMP Maintenance Responsibility/Frequency Matrix.
- Table 5 – Post Development Non-Structural BMP Maintenance Responsibility/Frequency Matrix.

N11 Litter Control

Each HOA or property management company shall schedule regular maintenance of their respective communities consisting of litter control and emptying of community trash receptacles. Litter control shall be conducted in accordance with Table 5 – Post Development Non-Structural BMP Maintenance Responsibility/Frequency Matrix.

N14 Catch Basin Inspection

Privately owned catch basins and grated inlets will be inspected and, if necessary, cleaned prior to the storm season, no later than October 1 each year, and in accordance with Table 5 – Post Development Non-Structural BMP Maintenance Responsibility/Frequency Matrix.

N15 Street Sweeping Private Streets and Parking Areas

Roadways and parking areas shall be cleaned on a monthly basis to reduce the discharge of pollutants into the storm drain system from paved surfaces. Onsite roadways and parking lots shall be swept prior to the storm season, no later than October 1 of each year. Street sweeping shall be performed in accordance with Table 5 – Post Development Non-Structural BMP Maintenance Responsibility/Frequency Matrix.

TABLE 3: NON-STRUCTURAL BMPs

APPROPRIATE NON-STRUCTURAL BMPs	RESIDENTIAL	INDUSTRIAL	RETAIL/OFFICE CENTER	RESTAURANTS WAREHOUSE GROCERY	FUEL DISPENSING	VEHICLE REPAIR MAINTENANCE
Homeowner/Tenant Education (N1)	X	X	X			
Activity Restrictions (N2)	X	X	X	X	X	X
Landscape Management (N3)	X	X	X			
BMP Maintenance (N4)	X	X	X	X	X	X
Title 22 CCR Compliance (N5)		X			X	X
Local Industrial Permit Compliance (N6)		X			X	X
Spill Contingency Plan (N7)		X			X	X
Underground Storage Tank Compliance (N8)		X			X	X
Haz-Mat Disclosure Compliance (N9)					X	
Uniform Fire Code Implementation (N10)		X			X	X
Litter Control (N11)	X	X	X	X	X	X
Employee Training (N12)	X	X	X	X	X	X
Housekeeping of Loading Docks (N13)		X		X		
Catch Basin Inspection (N14)	X	X	X	X	X	
Private Street/Lot Sweeping (N15)	X	X	X			
Commercial Vehicle Washing (N16)	X					X

BMPs circled are those applicable to the project site.

V. INSPECTION/MAINTENANCE RESPONSIBILITY FOR BMPs

The groups listed below shall be responsible for the inspection, implementation, and maintenance of the structural, non-structural and special structural BMPs outlined in this document in accordance with the Tables 4 and 5, Post Development BMP Maintenance Responsibility/Frequency Matrices.

Property management will retain all maintenance records for a period of three years. Those records will be available for review by government agencies. The names, addresses and telephone numbers of the HOAs and their property managers will be provided to the City of Newport when they become available.

Responsible Party
Coastal Farms Real Estates, LLC 837 Newport Center Drive Newport Beach, CA 92660 949/275-1858
Homeowners Association
To be determined at a later date 837 Newport Center Drive Newport Beach, CA 92660 949/275-1858

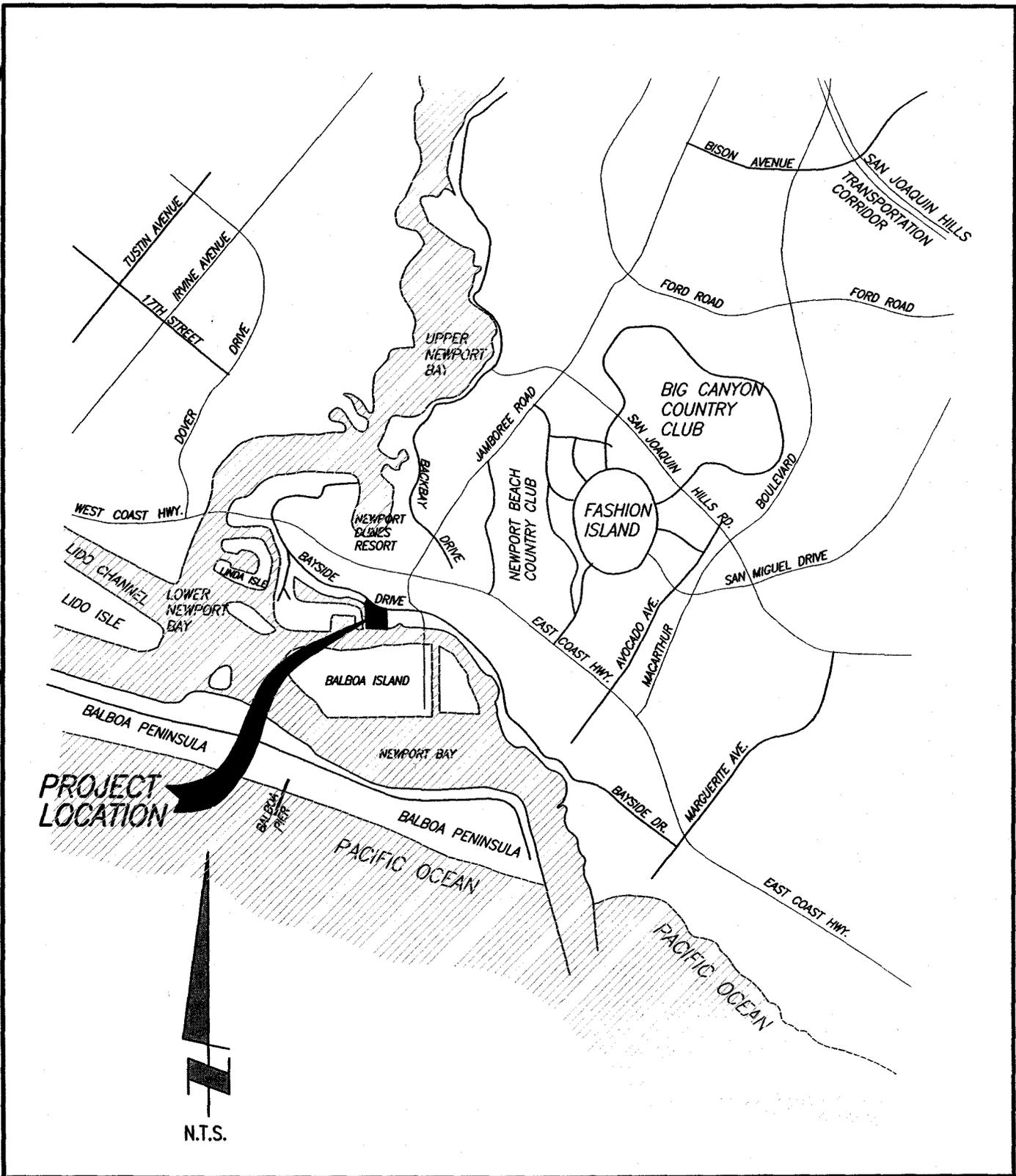
**TABLE 4: POST DEVELOPMENT STRUCTURAL BMPs MAINTENANCE
RESPONSIBILITY/FREQUENCY MATRIX**

BMP Designation	BMP Description	Responsible Party	Frequency of Maintenance
S1	Filtration	Homeowners Association	Once a week in conjunction with maintenance Activities and prior to finalizing and replanting Schemes.
S2	Efficient Irrigation	Homeowners Association	Once a week in conjunction with maintenance activities.
S3	Runoff – Minimizing Landscape	Homeowners Association	Once a week in conjunction with maintenance Activities and prior to finalizing and replanting Schemes.
S13	Catch Basin Stenciling	Homeowners Association	Visually inspect once every 6 months. Re-stencil as necessary.

**TABLE 5: POST DEVELOPMENT NON-STRUCTURAL BMPs MAINTENANCE
RESPONSIBILITY/FREQUENCY MATRIX**

BMP Designation	BMP Description	Responsible Party	Frequency of Maintenance
N1 & N2	Homeowner Education Activity Restrictions	Homeowners Association	Continuous.
N3	Landscape Management	Homeowners Association	Monthly during regular maintenance.
N11	Litter Control	Homeowners Association	Weekly collection.
N14	Catch Basin Inspection	Homeowners Association	No later than October 1 of each year.
N15	Street Sweeping	Homeowners Association	Monthly and prior to storm season (Oct. 1).

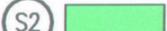
VI. WQMP EXHIBIT, VICINITY MAP & SITE PLAN



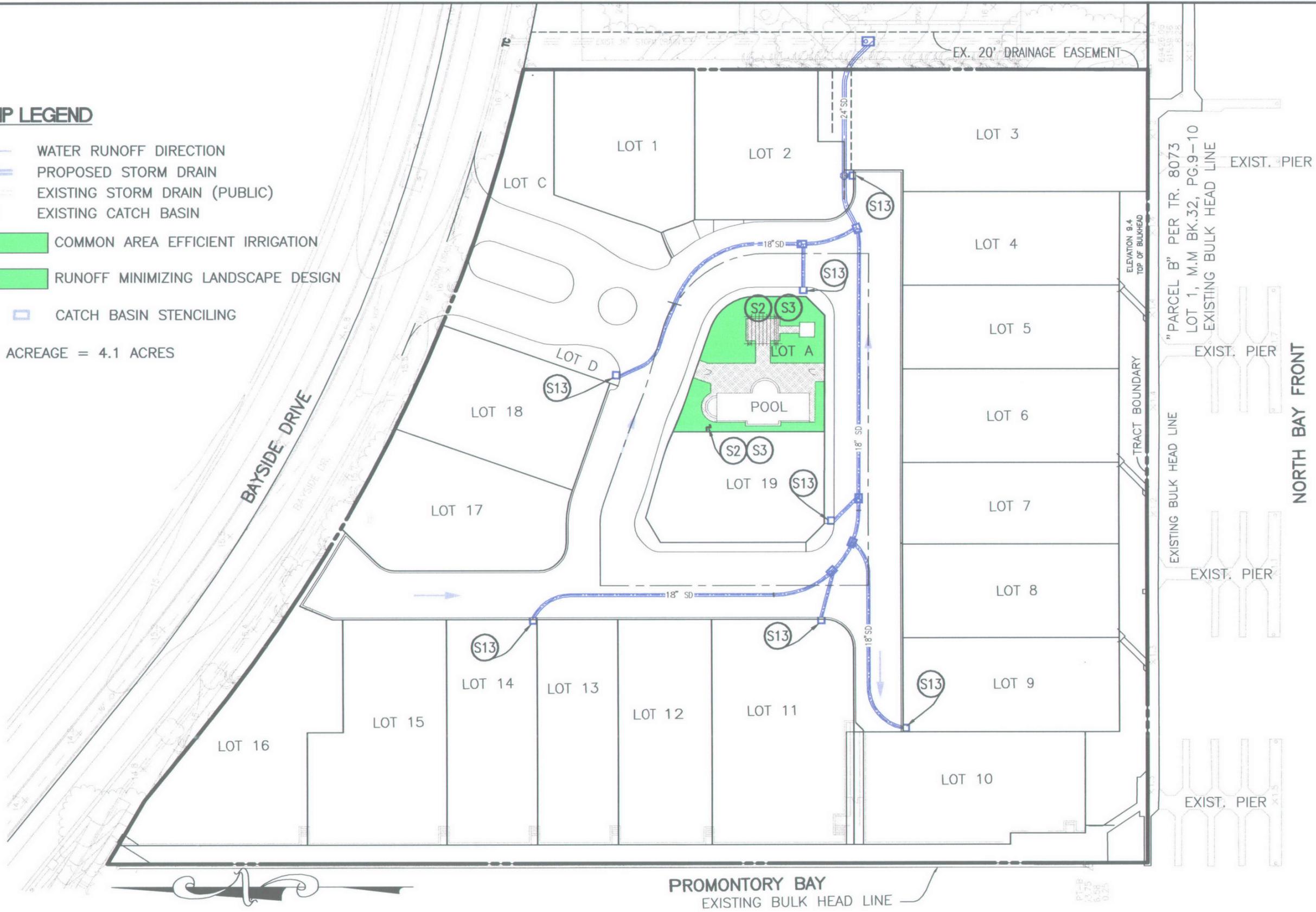
ADAMS • STREETER
CIVIL ENGINEERS, INC.
 15 Corporate Park, Irvine, CA 92606
 Ph: 949 474-2330 Fax: 949 474-0251

WQMP EXHIBIT
LOCATION MAP
TTM 15323
CITY OF NEWPORT BEACH

BMP LEGEND

-  WATER RUNOFF DIRECTION
-  PROPOSED STORM DRAIN
-  EXISTING STORM DRAIN (PUBLIC)
-  EXISTING CATCH BASIN
-  COMMON AREA EFFICIENT IRRIGATION
-  RUNOFF MINIMIZING LANDSCAPE DESIGN
-  CATCH BASIN STENCILING

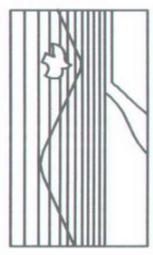
SITE ACREAGE = 4.1 ACRES



1 inch = 50 ft.

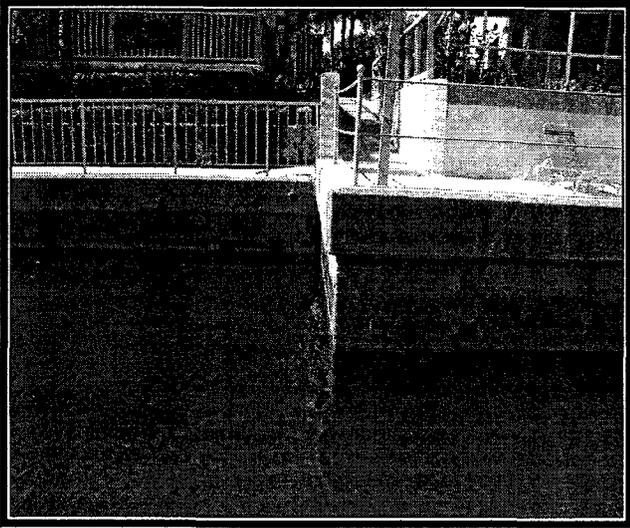
**WQMP EXHIBIT
BMP-DETAILS**
TRACT 15323
TY OF NEWPORT BEACH

Adams · Streeter
CIVIL ENGINEERS INC.
15 Corporate Park, Irvine, CA 92606
Ph: (949) 474-2330 Fax: (949) 474-0251

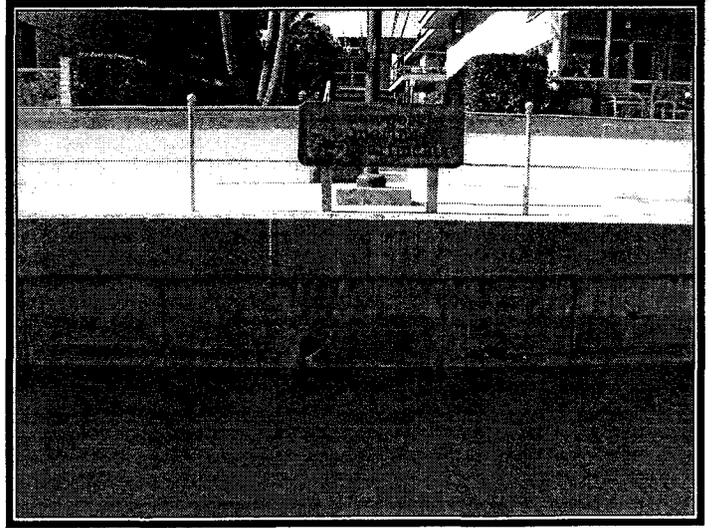


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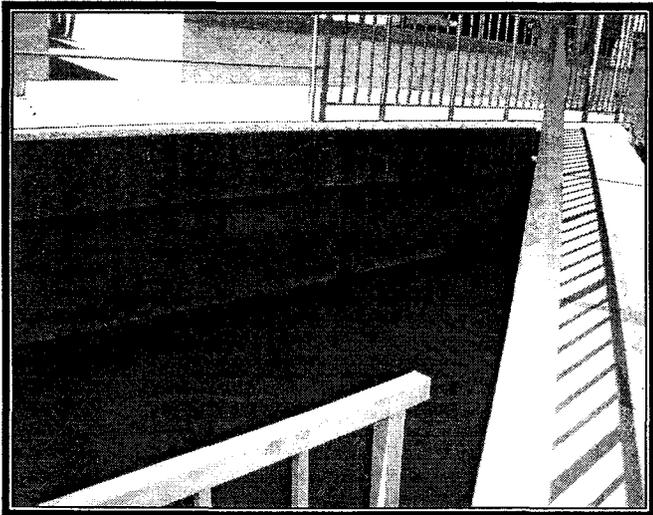
EXHIBIT



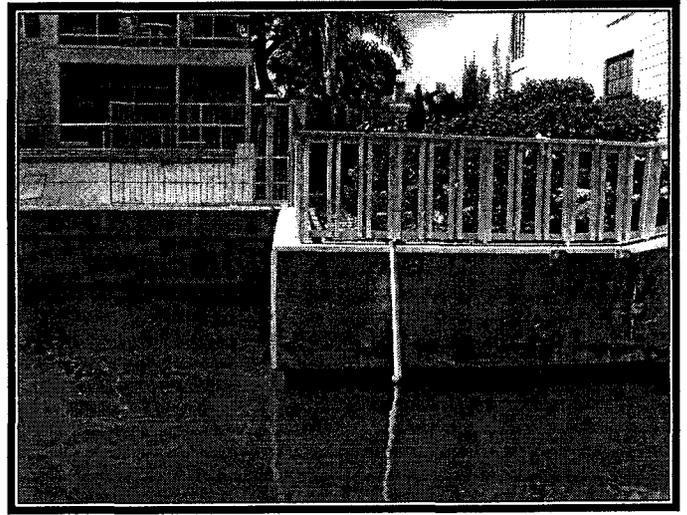
Outlet 1 & 2



Outlet 3



Outlet 4



Outlet 5

EXHIBIT 3

VII. ATTACHMENTS

A. NOTICE OF TRANSFER OF RESPONSIBILITY

**Water Quality Management Plan
Notice of Transfer of Responsibility**

Tracking No. Assigned by the City of Irvine: _____

Submission of this Notice of Transfer of Responsibility constitutes notice to the City of Irvine that responsibility for the Water Quality Management Plan ("WQMP") for the subject property identified below, and implementation of that plan, is being transferred from the Previous Owner (and his/her agent) of the site (or a portion thereof) to the New Owner, as further described below.

I. Previous Owner/Previous Responsible Party Information

Company/Individual Name		Contact Person	
Street Address		Title	
City	State	ZIP	Phone

II. Information about Site Transferred

Name of Project (if applicable)	
Title of WQMP Applicable to site:	
Street Address of Site (if applicable)	
Planning Area (PA) and/or Tract Number(s) for Site	Lot Numbers (if Site is a portion of a tract)
Date WQMP Prepared (and revised if applicable)	

III. New Owner/New Responsible Party Information

Company/Individual Name		Contact Person	
Street Address		Title	
City	State	ZIP	Phone

IV. Ownership Transfer Information

General Description of Site Transferred to New Owner	General Description of Portion of Project/Parcel Subject to WQMP Retained by Owner (if any)
Lot/Tract Numbers of Site Transferred to New Owner	
Remaining Lot/Tract Numbers Subject to WQMP Still Held by Owner (if any)	
Date of Ownership Transfer	

Note: When the Previous Owner is transferring a Site that is a portion of a larger project/parcel addressed by the WQMP, as opposed to the entire project/parcel addressed by the WQMP, the General Description of the Site transferred and the remainder of the project/parcel not transferred shall be set forth as maps attached to this notice. These maps shall show those portions of a project/parcel addressed by the WQMP that are transferred to the New Owner (the Transferred Site), those portions retained by the Previous Owner, and those portions previously transferred by Previous Owner. Those portions retained by Previous Owner shall be labeled "Previous Owner," and those portions previously transferred by Previous Owner shall be labeled as "Previously Transferred."

V. Purpose of Notice of Transfer

The purposes of this Notice of Transfer of Responsibility are: 1) to track transfer of responsibility for implementation and amendment of the WQMP when property to which the WQMP is transferred from the Previous Owner to the New Owner, and 2) to facilitate notification to a transferee of property subject to a WQMP that such New Owner is now the Responsible Party of record for the WQMP for those portions of the site that it owns.

VI. Certifications

A. Previous Owner

I certify under penalty of law that I am no longer the owner of the Transferred Site as described in Section II above. I have provided the New Owner with a copy of the WQMP applicable to the Transferred Site that the New Owner is acquiring from the Previous Owner.

Printed Name of Previous Owner Representative	Title
Signature of Previous Owner Representative	Date

B. New Owner

I certify under penalty of law that I am the owner of the Transferred Site, as described in Section II above, that I have been provided a copy of the WQMP, and that I have informed myself and understand the New Owner's responsibilities related to the WQMP, its implementation, and Best Management Practices associated with it. I understand that by signing this notice, the New Owner is accepting all ongoing responsibilities for implementation and amendment of the WQMP for the Transferred Site, which the New Owner has acquired from the Previous Owner.

Printed Name of New Owner Representative	Title
Signature	Date

B. GENERAL INFORMATION

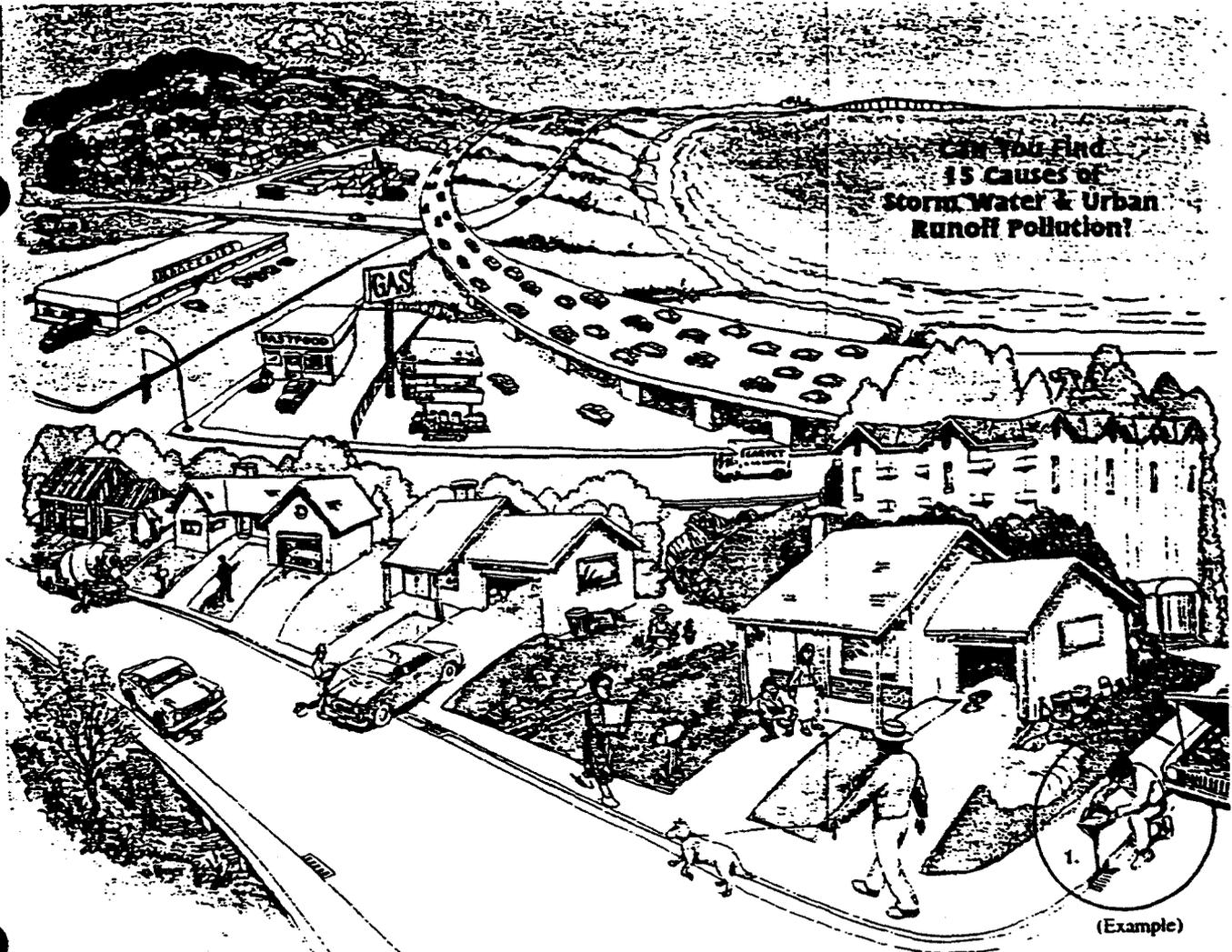
The Ocean Begins at Your Front Door

When it Rains, It Drains

Common Pollutants and Non-Industrial Pollutant Sources Associated with Urban Runoff

Common Contributors to Storm Water Pollution

Can You Find
15 Causes of
Storm Water & Urban
Runoff Pollution?



(Example)

The Ocean is closer than you think.

The picture shows how materials improperly used and disposed can go down the storm drain and flow into the Ocean!

STORM WATER & URBAN RUNOFF POLLUTION

Here are ways to reduce SWURP!

Home Maintenance



Buy household products such as cleaners and furniture polish labeled "non toxic". Use small quantities and purchase only the amount you need.



Properly use and store all toxic products, including cleaners, solvents and paints. Use up paint cleaners and other products or share leftovers with a neighbor.



Take household hazardous materials and containers to a hazardous material collection center. *



Use kitty litter or other absorbent materials to clean spills. Depending on the substance, dispose absorbents in the trash can or at a hazardous materials collection center. *

* For more information, see Telephone Numbers on the back of this brochure.



Rinse water based paint brushes in the sink. Filter and reuse paint thinner or brush cleaners. Dispose of used thinner, oil and latex paint at a hazardous materials collection center. *



Recycle reusable materials. Throw litter into trash cans and keep cans tightly covered to prevent foraging by animals.



Control erosion at construction and landscape sites to prevent dirt and debris from entering storm drains.

Lawn and Garden



Use pesticides, herbicides and fertilizers in accordance with label instructions. Do not apply before rain and dispose leftovers at a hazardous materials collection center. *



Use a broom rather than a hose to clean up garden clippings. Put leaves and clippings in a trash can or a compost pile.



Divert rain spouts and garden hoses from paved surfaces onto grass to allow water to filter through the soil. Water only your lawn and garden. Caution: do not use this suggested action in areas with steep slopes or landslide potential.



Pick up animal waste and dispose in the trash can.

Automotive



Take used motor oil and antifreeze to gas stations that accept recyclable automotive fluids, or to a hazardous materials collection center. *



Have your car maintained regularly to prevent oil, antifreeze and other fluid leaks.



Reduce automotive emissions through routine auto maintenance, ride sharing and public transportation.



Conserve water when washing your car and use biodegradable soap. Clean engines at a "Do It Yourself Car Wash" where the drainage is not connected to the storm drain.

You can control SWURP by supporting city and county activities to keep your streets clean. You can help by participating in recycling, beach clean-ups, and the proper disposal of hazardous materials.

Since many businesses and residents are unaware of the storm water & urban runoff problem, encourage neighbors and co-workers to be careful in not polluting the storm drain system.

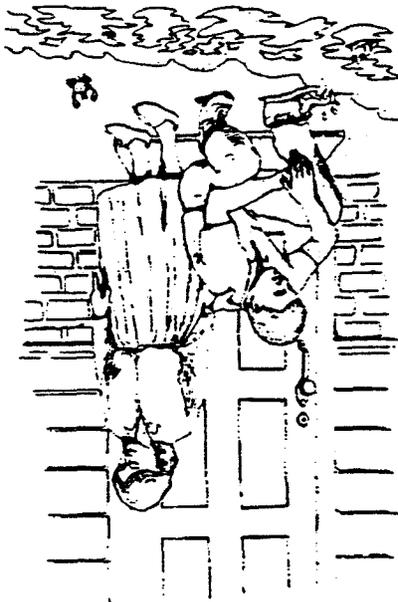
Together, you, your neighbors and city can make a difference in keeping the ocean and beaches clean for ourselves and wildlife. Contact the Storm Water Participant in your area to share ideas or ask questions on keeping storm drains clean.



A Cooperative Project between
the County of Orange, its City
and the Orange County
Department of Public Works

Storm Water & Urban Runoff Pollution (SWURP)
 And What You Can Do To Stop It!

Orange County Environmental Management Agency
 and the County of Orange, its Cities
 A Cooperative Project Between
 the County of Orange, its Cities
 Environmental Management Agency



The Ocean
 begins at your
 front door!

Even though you live miles from the Pacific Ocean, you may be polluting it without knowing it.

Did You Know...

Anything we use in our home, car and business like motor oil, paint, pesticides, fertilizers and cleaners can wind up in the street.

A little water from rain or a garden hose can carry automotive and household materials through the storm drain polluting bays, wetlands and the ocean. Storm drains are there to drain water off the street - not for disposal of hazardous materials.

Before you pour anything into the gutter or down the drain, stop and think!



Because storm drains are separate from our sewer system.

Where Does It Go?

These pollutants flow together on a journey: from the storm drain to the flood control channel where it can eventually empty into the ocean. This type of pollution is called Storm Water & Urban Runoff Pollution (SWURP) and is a serious threat to the beaches and ocean of Southern California.

What Is Storm Water & Urban Runoff Pollution (SWURP)?

Storm water runoff refers to seasonal rainfall flows. It is very noticeable during a heavy rain storm when large volumes of water drain off paved areas. Urban runoff can happen anytime of the year when excessive water use from irrigation, car washing and other sources carries litter, lawn clippings and other urban pollutants into storm drains. Even an automobile leaking motor oil 20 miles inland can still pollute the ocean.

How Is It Different From Other Forms of Water Pollution?

SWURP can include anything that washes into the storm drain from the community. Unlike water pollution linked to factories or sewage treatment plants, SWURP can come from city streets, neighborhoods, farms, construction sites and parking lots.

Storm drains go directly into channels and creeks...

Storm Water & Urban Runoff Pollution Comes From:

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids down the storm drain.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides, herbicides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste and other organic matter.
- Oil stains on parking lots and paved surfaces.

Storm Water & Urban Runoff Pollution And The Ocean

SWURP may have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. It can also degrade recreation areas such as beaches, harbors and bays.

...and through wetlands and bays to the ocean.

Orange County Storm Water Program Participants

- 254-1299 Anaheim Public Works/Engineering
- 949-7760 Brea Engineering
- 949-7760 Brea Public Works
- 714-5248 Com Mesa Public Services
- 779-6752 Citrus Engineering
- 748-3560 Dana Point Public Works
- 365-4478 Fountain Valley Public Works
- 774-6322 Fullerton Engineering Dept
- 714-5181 Garden Grove Development Services
- 756-5242 Huntington Beach Public Works
- 714-6125 Irvine Public Works
- 1310 905-4792 La Habra Public Services
- 925-4140 La Palma Public Works
- 497-7711 Laguna Beach Municipal Services
- 707-5000 Laguna Hills Engineering
- 707-5327 Laguna Niguel Public Works
- 707-5583 Lake Forest Public Works
- 837-8670 Las Alamos Community Dev
- 452-2489 Mission Viejo Public Works
- 644-3311 Newport Beach Public Works
- 722-5551 Orange Public Works
- 992-8131 Placentia Engineering
- 498-2532 San Clemente Engineering
- 493-1171 San Juan Capistrano Engineering
- 949-3320 Santa Ana Public Works
- 1310431-2577 San Diego Engineering
- 793-9222 San Juan Public Works
- 923-2150 Tustin Public Works/Engineering
- 998-1500 Villa Park Engineering
- 998-3311 Westminster Public Works/Eng
- 961-7170 Yorba Linda Engineering
- 567-5711 Yuba Sotom Water Program
- 572-2584 For Additional Businesses

Other Important Phone Numbers:

- 1714 834-6752 Orange County Historical Museum
- 714 834-6752 Orange County Historical Museum
- 714 834-6752 Orange County Historical Museum

For information on applying for grants, contact the

California Department of Water Resources at 911

714 834-6752

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Debris along street picked up by storm water.

WHY IS STORM WATER A PROBLEM?

Storm water is a problem when it picks up debris, chemicals, and other pollutants as it flows or when it causes flooding and erosion of stream banks. The pollutants are deposited untreated into our waterways. The result can be the closing of our beaches; no swimming, fishing or boating; and injury to the plants and animals that live in or use the water.

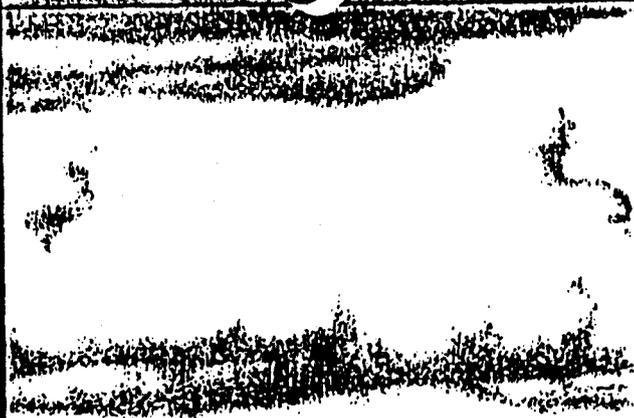
WHAT ARE THESE POLLUTANTS? WHERE DO THEY COME FROM? WHAT ARE SOME OF THEIR EFFECTS ON PLANTS, ANIMALS, AND HUMANS?

The following information will answer these questions and let you know what you and your community can do to help recognize where there could be a problem and what to do to help solve it!

EPA has a storm water program that, with your help, can keep our rivers, lakes, streams, and oceans open to use and enjoyment, and healthy for plants and animals to live in.

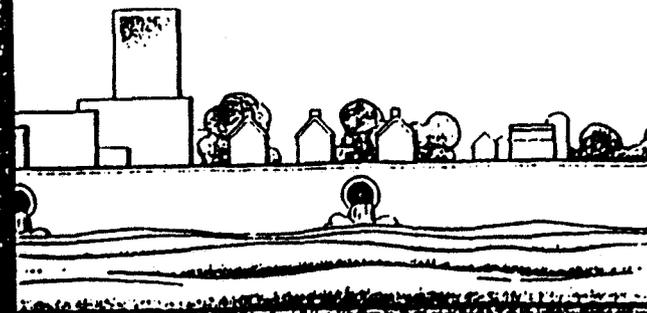


Debris washed up on the beach by storm water.



WHERE DOES THE STORM WATER GO AFTER IT DRAINS INTO STORM SEWERS?

Storm water that does not seep into the ground, drains into systems of underground pipes or roadside ditches and may travel for many miles before being released into a lake, river, stream, wetland area, or coastal waters.



WHERE CAN I FIND OUT MORE INFORMATION?

Your EPA Regional Office
(Water Management Division)

1. EPA Region I (CT, ME, MA, NH, RI, VT)
JFK Federal Bldg.; Boston, MA 02203
617-565-3478
2. EPA Region II (NJ, NY, PR, VI)
26 Federal Plaza; New York, NY 10278
212-264-2513
3. EPA Region III (DE, MD, PA, VA, WV, DC)
841 Chestnut Street; Philadelphia, PA 19107
215-597-9410
4. EPA Region IV (AL, GA, FL, MS, NC, SC, TN, KY)
345 Courtland St., NE; Atlanta, GA 30365
404-547-4450
5. EPA Region V (IL, IN, OH, MI, MN, WI)
77 W. Jackson Blvd.; Chicago, IL 60604
312-353-2145
6. EPA Region VI (AR, LA, OK, TX, NM)
1415 Ross Ave., Suite 1200
Dallas, TX 75202-2733
214-655-7100
7. EPA Region VII (IA, KS, MO, NE)
726 Minnesota Ave.; Kansas City, KS 66101
913-551-7030
8. EPA Region VIII (CO, UT, WY, MT, ND, SD)
999 18th St., Suite 500; Denver, CO 80202
303-293-1542
9. EPA Region IX (AZ, CA, GM, HI, NV)
75 Hawthorne Street; San Francisco, CA 94105
415-744-2125
10. EPA Region X (AK, ID, OR, WA)
1200 Sixth Ave.; Seattle, WA 98101
206-553-1293

Other sources include:

- Storm Water Hotline (703) 821-4824
- State and Local Agencies

 Recycled/Recyclable
Printed with SoyInk and a 100% recycled paper that
contains at least 50% recycled fiber.

United States
Environmental Protection
Agency
Office of Water

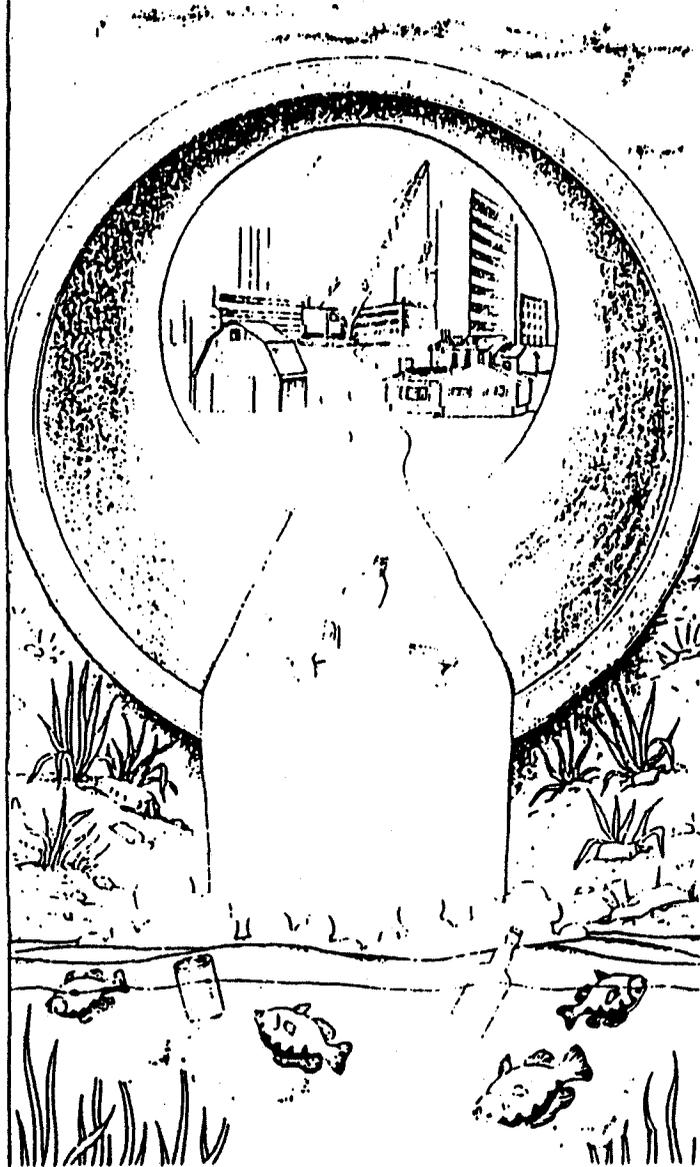
August 1993
832-F-93 002

W11 547



When It Rains, It Drains

What Everyone Should
Know About Storm Water



WHAT IS STORM WATER?

Storm water is water from precipitation that flows across the ground and pavement when it rains or when snow and ice melt. The water seeps into the ground or drains into what we call storm sewers. These are the drains you see at street corners or at low points on the sides of your streets. Collectively, the draining water is called storm water runoff and is a concern to us in commercial and industrial sites as well as your neighborhood because of the pollutants it carries.

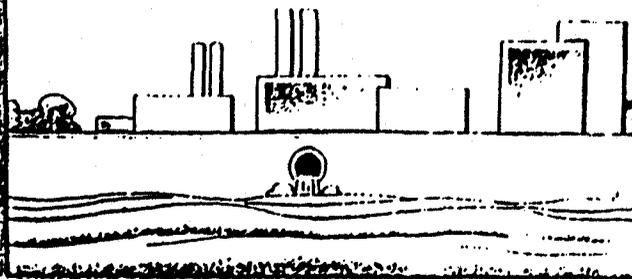


Exhibit 1 (cont.): Common Pollutants and Non-Industrial Pollutant Sources Associated with Urban Runoff

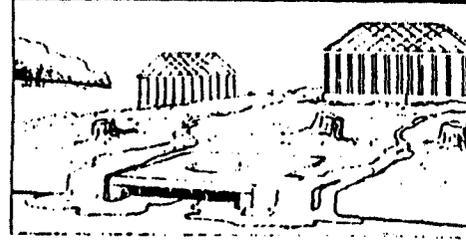
Pollutant	Source (Category: Components)
Nitrogen, Phosphorous	Vehicles: exhaust Other: combustion product Landscape maintenance: fertilizer Soil erosion: land disturbance, exposed soils Sewage: leaking sanitary systems, septic systems
Sediments, Particulates	Soil erosion, land disturbance, exposed soils Streambank erosion: high flows Vehicles: Body rust, tire wear, other wear
Pesticides	General outdoor application Structures: wood preservatives, paint
Flotables	Litter: residential, commercial, industrial, recreation Waste disposal: residential, commercial, industrial recreation Vegetation: leaves, branches, trunks
Bacteria	Sewage: leaking sanitary systems, septic systems Other: animal droppings Soil erosion: exposed soils
Oil and grease	Vehicles: drippings, leaks Paved surfaces: asphalt Equipment maintenance: exposed surfaces Other: wood preservatives, wood/coal combustion
PCBs	Vehicles: catalyst in synthetic tires Other: electrical, insulation
Benzene	Vehicles: fuel Other: solvent use
Toluene	Vehicles: fuel and asphalt Other: solvent use
Chloroform	Vehicles: form by mixing salt, gasoline and asphalt
Oxygen Demand	Vehicles: leaves Litter: various sources Soil erosion: land disturbances, exposed soils
Phthalate, bis (2-eth.)	Structures: plasticizer Other: plasticizer

Sources: EPA, 1992, 1990, 1983; Kobriger et al., 1984.

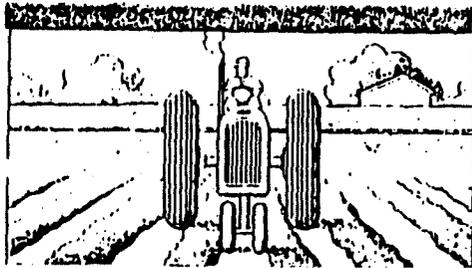
COMMON CONTRIBUTORS TO



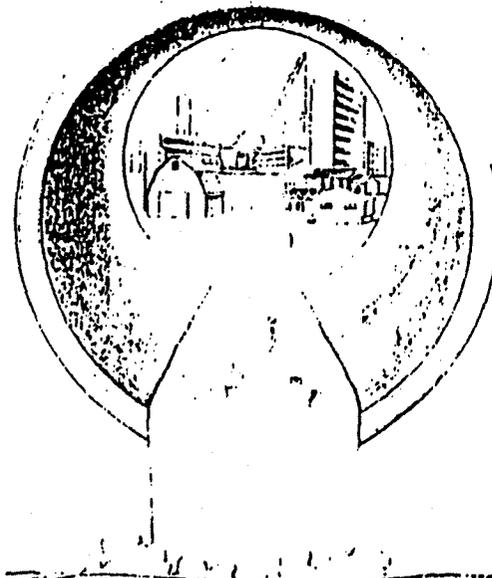
INDUSTRY At industrial sites, chemical spills that contain toxic substances, smoke stacks that spew emissions, and uncovered or unprotected outdoor storage or waste areas can contribute pollutants to storm water runoff.



CONSTRUCTION Waste from chemicals and materials used in construction can wash into our waterways during wet weather. Soil that erodes from construction sites can contribute to environmental degradation as well.

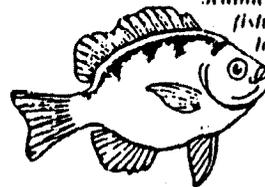


AGRICULTURE Pesticides, fertilizers, and herbicides used in crop production can be toxic to aquatic life and can contribute to over-enrichment of the water, causing excess algae growth and oxygen depletion. Although storm water runoff from agricultural areas is not regulated under the EPA storm water permitting program, it is a nonpoint source of storm water pollution covered under other EPA programs.

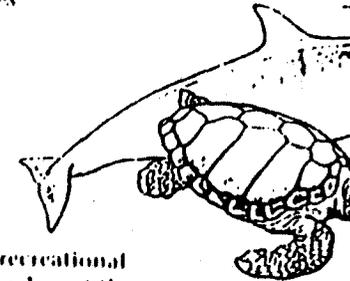


WHAT ARE SOME OF THEIR EFFECTS ON PLANTS, ANIMALS, AND HUMANS?

When polluted storm water runoff reaches our waterways, it can have many adverse effects on aquatic plant and animal life, other wildlife that use the water, humans who drink the water, use it for

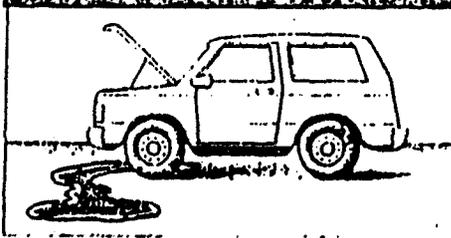


Sediment and other debris clog fish gills, damage fish habitat, and block the light needed for the plants to survive.

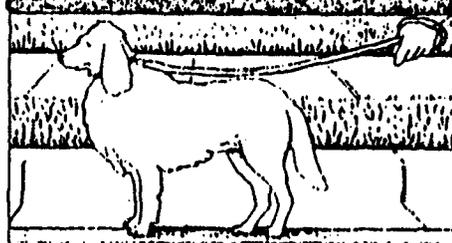


fishing, boating, swimming and other recreational activities, and on humans and animals who eat the contaminated fish and other seafood.

STORM WATER POLLUTION



HOUSEHOLD Vehicles drip fluids (oil, grease, gasoline, antifreeze, brake fluids, etc.) onto paved areas where storm water runoff carries them through our storm drains and into our waterways.



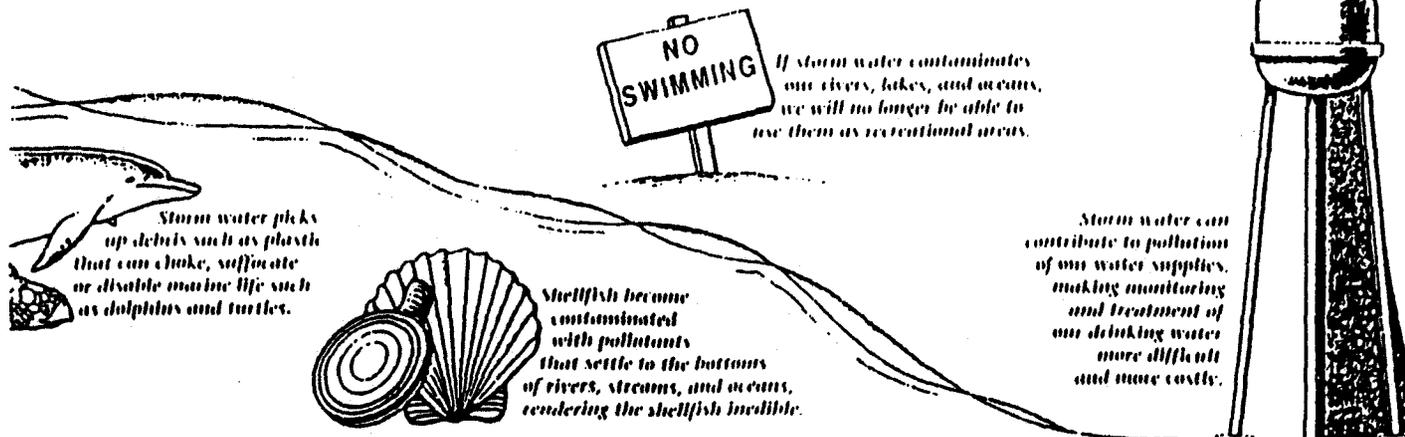
HOUSEHOLD - Pet wastes left on the ground get carried away by storm water, contributing harmful bacteria, parasites and viruses to our waterways.



HOUSEHOLD Chemicals used to grow and maintain beautiful lawns and gardens, if not used properly, can run off into the storm drains when it rains or when we water our lawns and gardens.

OTHER COMMON HOUSEHOLD PRODUCTS THAT COULD CAUSE POLLUTION IF CARRIED OFF BY STORM WATER RUNOFF OR DUMPED DOWN STORM SEWERS:

- Ammonia-based cleaners, drain cleaners
- Car care products such as detergents with phosphate and car waxes
- Paint, paint thinners, varnish, furniture refinishing products, paint brush cleaners
- Concrete or wood sealants
- Degreasers
- Chlorine bleaches and disinfectants (for swimming pools, etc.)



NO SWIMMING

If storm water contaminates our rivers, lakes, and oceans, we will no longer be able to use them as recreational areas.

Storm water picks up debris such as plastic that can choke, suffocate or disable marine life such as dolphins and turtles.

Shellfish become contaminated with pollutants that settle to the bottoms of rivers, streams, and oceans, rendering the shellfish inedible.

Storm water can contribute to pollution of our water supplies, making monitoring and treatment of our drinking water more difficult and more costly.

WHAT CAN I DO TO HELP?

First, become more aware of what may be causing storm water pollution in your area.

Second, help your municipality by:

1. Reporting to your local municipal officials -
 - Any dumping of inappropriate materials into storm water drains (such as oil, antifreeze).
 - Construction sites over 5 acres that do not have erosion or sediment controls.
2. Using good housekeeping practices with lawn care chemicals, oil, gasoline, pet wastes, etc.
3. Helping to start or participating in programs to recycle and safely dispose of used oil and household hazardous wastes and containers.
4. Telling others about pollution from storm water runoff and what they can do to help.

Exhibit 1
Common Pollutants and Non-Industrial
Pollutant Sources Associated with Urban Runoff

Pollutant	Source (Category: Components)
Lead	Vehicles: exhaust, tire wear (filler material, lubricating oil and grease) Structures and roads: paint
Zinc	Vehicles: tire wear (filler material), oil and grease (stabilizing additive), metal corrosion Paved surfaces: deicing salts Structures: paint, metal corrosion, wood preservatives
Copper	Vehicles: parts wear (brakes, metal plating, bearing and bushings), diesel fuel Structures: paint, metal corrosion, wood preservatives Others: pesticides
Cadmium	Vehicles: tire wear (filler material), Pesticides
Chromium	Vehicles: parts wear (brakes, metal plating, engine parts)
Nickel	Vehicles: diesel fuel, lubricating oil, parts wear (brakes, metal plating, and bushings) Paved surfaces: asphalt
Manganese	Vehicles: parts wear (engine parts)
Bromide	Vehicles: exhaust
Mercury	Coal Combustion Vehicles: fuel combustion Structures: paint
Iron	Vehicles: body rust, engine wear Structures: rust
Cyanide	Paved surfaces: deicing salts Structures: wood preservatives
PAHs	Vehicles: exhaust Other: incomplete information
Chloride	Paved surfaces: deicing salts
Sulphates	Other: combustion product Vehicles: exhaust Paved surfaces: road beds, deicing salts

Sources: EPA, 1992, 1990, 1983; Kobriger et al., 1984.

Precyclin



R_x for living

- ✓ Reduce
- ✓ Reuse
- ✓ Recycle

California Integrated Waste Management Board

Precyclin[®]

R_X for living

Precyclin[®] isn't a product. It's not a thing.

You can't buy it. It's not for sale.

It's good medicine and we want you to use it.

But you can't take it.

So what is it exactly?

- ⊕ Precycling means considering the waste implications of your purchases. In other words: Reduce waste before you buy.
- ⊕ Every product we consume in our daily routine creates waste. That's bad.
- ⊕ We can recycle some of the waste. That's good.
- ⊕ But what if we made a conscious effort to create less waste? That would be good medicine for living and even better medicine for the environment.

You can probably think of some tips of your own. If you practice these tips you will truly be a precycler, and make a difference!

For More Information

For details on source reduction, recycling and composting, contact the California Integrated Waste Management Board at 916-322-3330. Helpful fact sheets and other information are available.

**Call our Recycling Hotline toll-free:
1-800-553-2962**

Monday through Friday,
7:30 a.m. — 5:30 p.m.

We can also provide details on convenient recycling centers and local household hazardous waste activities.

**California Integrated Waste
Management Board
1020 Ninth Street, Suite 100
Sacramento, CA 95814**

Read on for some helpful tips about preserving resources and minimizing waste.

Here's How You Can Precycle

- ⊕ Be a "Waste-Aware" consumer (see below).
- ⊕ Use products which can be reused and repaired, rather than "disposable" products used for the sake of convenience.
- ⊕ Practice source reduction in the work place. For example, use recycled paper products, make double-sided copies, and reuse scrap paper and manila envelopes.
- ⊕ Be an example for others. Good ideas catch on!
- ⊕ Continue to recycle paper, glass, plastic, aluminum and other recyclables.
- ⊕ Buy items such as flour, pasta, rice or cereal in bulk and store them in durable containers. Buying products in larger sizes is more economical and reduces packaging.
- ⊕ Use durable products such as reusable cups and utensils, instead of paper, plastic or foam containers.
- ⊕ Look for multiple-use products such as refillable pens, beverage containers and durable food storage containers.
- ⊕ Repair things instead of discarding them.
- ⊕ Landscape with shrubs and plants that require less water and less pruning.

The "Waste-Aware" Consumer

Here are some pointers for the "waste-aware" shopper to consider:

- ⊕ Purchase products made from recycled and recyclable materials.
 - ⊕ Reduce costs for waste collection, transportation, and disposal.
 - ⊕ Enjoy lower product costs.
 - ⊕ Save natural resources.
 - ⊕ Extend the life of our landfills.
-

Smart Shopper's List

This list provides shopping ideas for the environmentally smart consumer.
Remember these important shopping tips:

- ⊕ bring your cloth shopping bags
 - ⊕ reuse old plastic bags for produce
 - ⊕ don't go to the store hungry
 - ⊕ purchase only what you need
-

Purchase

bulk products
concentrated juice
sponges, kitchen towels,
cloth napkins
"giant economy size"
recycled paper products
concentrated cleaners
brewers yeast, flea comb
reusable or "cartridge" razors
rechargeable batteries
coffee mugs
cloth diapers
beeswax and linseed oil
baking soda, lemon, vinegar,
club soda
cedar chips
products in recyclable containers

Instead of

pre-packaged items
bottled or small packages
paper towels and convenience wipes
small packages
paper made from virgin stock
cleaners pre-mixed and ready to use
flea powder or sprays
disposable razors
disposable batteries
polystyrene or paper cups
disposable diapers
furniture polish
caustic cleaners
moth balls
non-recyclable packaging



The Solution Is To Recycle

Marine Debris — A Preventable Sickness

The next time you are out on your boat or casually stroll down a dock, take a look around. Is the water clean, is the shoreline free of debris, is animal life abundant? The answer is probably no. The ocean is threatened. Threatened by a sickness that you can prevent—the dumping of your debris into the water.

The U.S. Coast Guard estimates that over 800 tons of garbage are dumped annually into U.S. waters. California marinas alone, generate 5 to 3,000 tons of garbage per marina each year.

Every time you toss your trash into the ocean you become part of the problem. Your trash could be responsible for the death of an animal, a boating accident, or a polluted beach.

There is a solution — something you can do — slow your trash and recycle it.

Four Easy Steps to Recycling

Successful marine debris recycling requires that you...

1. Stop dumping trash into the ocean. Whether you are on a boat or enjoying the ocean from shore, don't carelessly toss your debris. Every can, cigarette butt, and plastic bag hurts!

2. On shore or at sea, slow your trash and separate recyclable items. You can recycle newspaper, glass jars and bottles, some plastics, paper, aluminum and steel cans, cardboard, scrap metal, wood, oil, batteries, and more. Recent studies indicate that over 60% of a marina's garbage can be recycled. Dispose of your non-recyclable trash in an appropriate receptacle.

3. Take your recyclable items to a recycling center. Centers are available in most communities and many marinas have their own recycling program.

4. Purchase wisely. When you buy new products look for items packaged in recyclable materials, or better yet, purchase reusable items. The less you need to throw away or recycle, the better for the ocean, the environment, and your pocket book.

There are also some not so obvious reasons to recycle:

- provides a cost-effective way to eliminate trash
- helps maintain a marina's waste management costs (which eventually come back to you, the consumer)
- provides positive PR for you, your vessel, and your marina

There are obvious reasons to recycle:

- saves natural resources
- eliminates trash in the ocean
- provides an alternative to the use of landfills





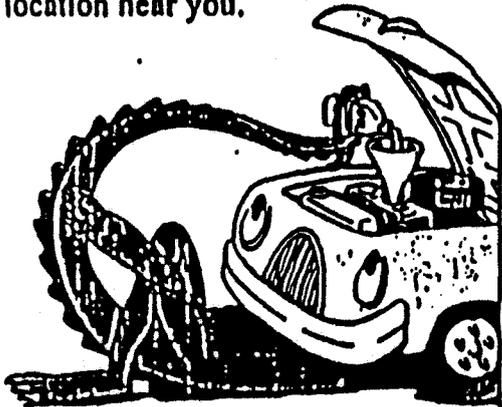
**RECYCLING...
IT'S EASY
TO DO!**

Drain your used oil into a reusable plastic container that has a screw top. Unless the container was previously used to hold motor oil, make sure it is **CLEAN** before placing your used oil in it.

Do not mix your oil with anything (paint, gasoline, solvents, etc.). In order to be recycled, your used oil must be free of contaminants.

If you're changing your oil filter, drain it completely, seal it in a plastic zip-lock bag, and bring it to a collection center that accepts oil filters for recycling. Not all centers do. Check first!

Bring your used oil to a collection center that recycles it. Call 1-800-RECY OIL for a location near you.



Recycling used oil could reduce petroleum imports by **1.3 million barrels of oil per year**, saving **1.3 million barrels of oil per day**.

**BUY RECYCLED
...AND KEEP A GOOD
THING GOING**



The three arrows in the recycling logo represent three steps necessary in closing the recycling loop: **collecting** the material; **re-manufacturing** it into a "new" product; and **purchasing** the product. With used oil, this loop is closed as the oil goes from the collection program, to the manufacturer, to the consumer, and back to the collection program where the process begins again. This is possible because

**OIL NEVER WEARS OUT;
IT JUST GETS DIRTY!**

Dirty oil can be recycled many times. Re-refined oil can be used for hydraulic and crankcase oil. Ask for re-refined or recycled oil where you shop. Help close the recycling loop and save our natural resources.

It takes only 1 gallon of used oil to produce the same amount of motor oil as 42 gallons of crude oil - while requiring **1/3** of the energy!

USED OIL AND THE LAW

- Used oil is considered a hazardous waste in California.
- It's against the law to use used motor oil for weed abatement activities or dust control.
- Used oil can carry heavy metals and toxics into nearby waterways.
- It's illegal to bury used oil in the ground, burn it, or dump it in the trash or down a storm drain or sewer.

Illegal disposal should be reported to the State at 1-800-69 TOXIC

**IT'S NOT
"OIL" - RIGHT
TO IGNORE
THE LAW**



42% of all used oil available for recycling in California never reaches a recycling facility. Do you know where YOUR used oil goes?

The more waste we generate, the more we have to treat, store, and dispose of. So recycling makes more sense today than ever.

Improper waste management costs money—your money! You pay in higher consumer prices, taxes for environmental cleanups, and increased health care costs, when wastes are improperly managed.

Recycling saves money *and* protects the environment. So help be part of the solution, not part of the problem. Recycle used oil and other household materials, such as newspaper, glass, metals, and plastic.

If your community has an oil recycling program, join it. If it doesn't, start one. Write for EPA's manual entitled "How to Set Up A Local Program To Recycle Used Oil" at the address below or call EPA's RCRA/Superfund Hotline at 1-800-424-9346 (in Washington, DC, 382-3000).

Remember:

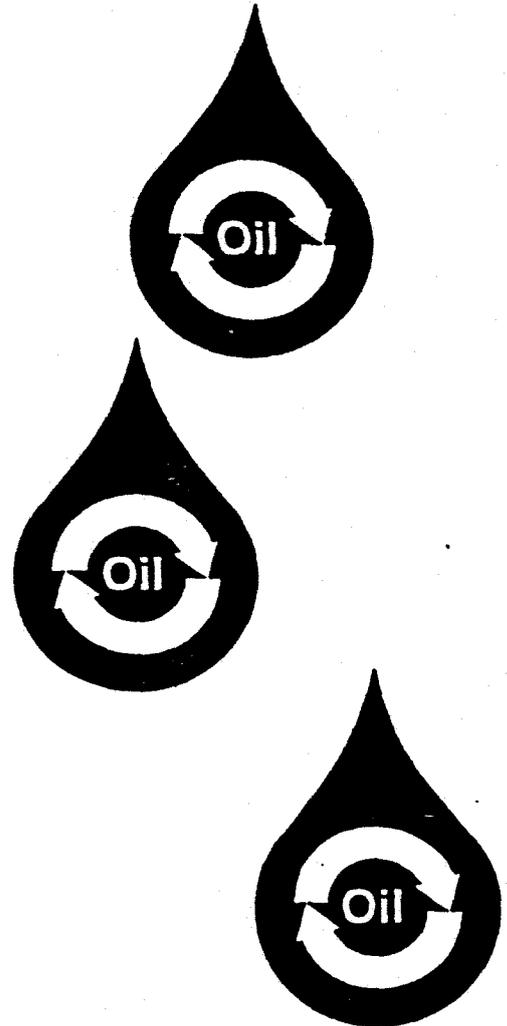
Environmental quality is everybody's business, and everybody can do a lot to help.

U.S. Environmental Protection Agency
Office of Solid Waste
401 M Street, SW
Washington, DC 20460



Recycling Used Oil

What Can You Do?



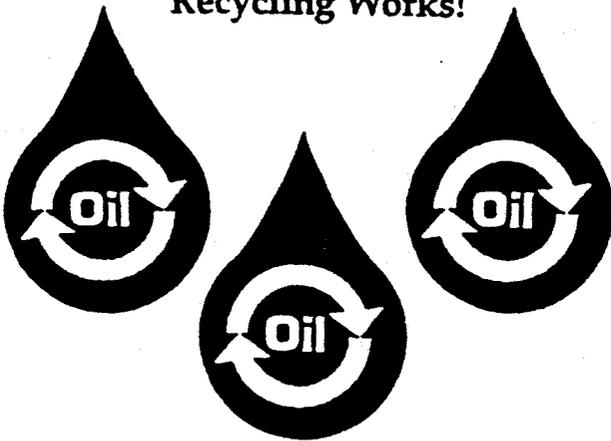
Why Recycling Your Oil Helps The Environment And Saves Energy

o Used oil from a single oil change can ruin a million gallons of fresh water—a year's supply for 50 people. Used oil is insoluble, persistent, and can contain toxic chemicals and heavy metals. It's slow to degrade. It sticks to everything from beach sand to bird feathers. Used oil is a major source of oil pollution in our nation's waterways.

o "Do-it-yourselfers"—consumers who change their own oil—generate at least 200 million gallons of used oil every year. Americans who change their own oil throw away 120 million gallons of recoverable motor oil by dumping it on the ground, by pouring it down stormdrains, or by putting it in trash cans.

o Recycling this oil would save the United States 1.3 million barrels of oil per day. One gallon of used oil provides the same 2.5 quarts of lubricating oil as 42 gallons of crude oil.

Recycling Works!



What Can You Do?

RECYCLE !

Today, almost 60 percent of the nation's automotive oil is changed by consumers themselves.

Recycle used oil from cars, trucks, boats, motorcycles, recreational vehicles, and lawnmowers.

It's easy to recycle used oil . . .

Put your used oil in a clean plastic container with a tight lid.



Don't mix it with anything else (paint, gasoline, solvents, antifreeze, etc.).



Take it to a service station or other location that collects used oil for recycling.



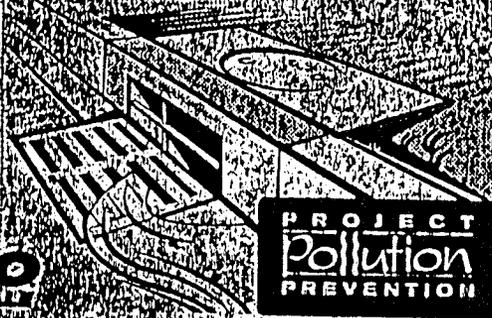
Call your local or state government to find out where.

Storm Drains are for Rain...



More than 529,000
tires each year
California's cities
change their motor oil and don't
recycle it. And, more than 270,000
tires each year, radiator fluid is
drained from vehicles by residents
and isn't recycled.
Some dispose of automotive fluids
and vehicle products in household
hazardous waste in the street or
gutter. Take them to your local auto repair
station, recycling center or household
hazardous waste roundup.

...they're not
recycling centers.



COSTCO
WHOLESALE

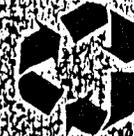
PROJECT
POLLUTION
PREVENTION

Recycling Tips:

COSTCO
WHOLESALE

You can help keep your community clean, protect our area waterways and make the beaches safe for ocean swimmers by putting recyclable materials where they belong — at a recycling center or household hazardous waste roundup. Never throw or pour anything into the streets or gutters.

- When changing vehicle fluids — transmission, hydraulic and motor oil, brake and radiator fluid — drain them into a drip pan to avoid spills. Do not combine these fluids. Do not dispose of these used fluids in the street, gutter or in the garbage. It is illegal.
- Recycle all used vehicle fluids. Call 1-888-CLEAN-LA for the location of an auto repair shop that recycles these fluids, or for the location of a local household hazardous waste roundup.
- Other materials that should be taken to a household hazardous waste roundup are: paint and paint-related materials, household cleaners, batteries, pesticides and fertilizers, pool chemicals, and aerosol products.
- Aluminum, glass, aluminum containers and newspapers should be placed in your curbside recycling bin or taken to a local recycling center.



PROJECT
POLLUTION
PREVENTION

-

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-

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D. PROCEDURES & MAINTENANCE

Inlet Cleaning

Spot Cleaning

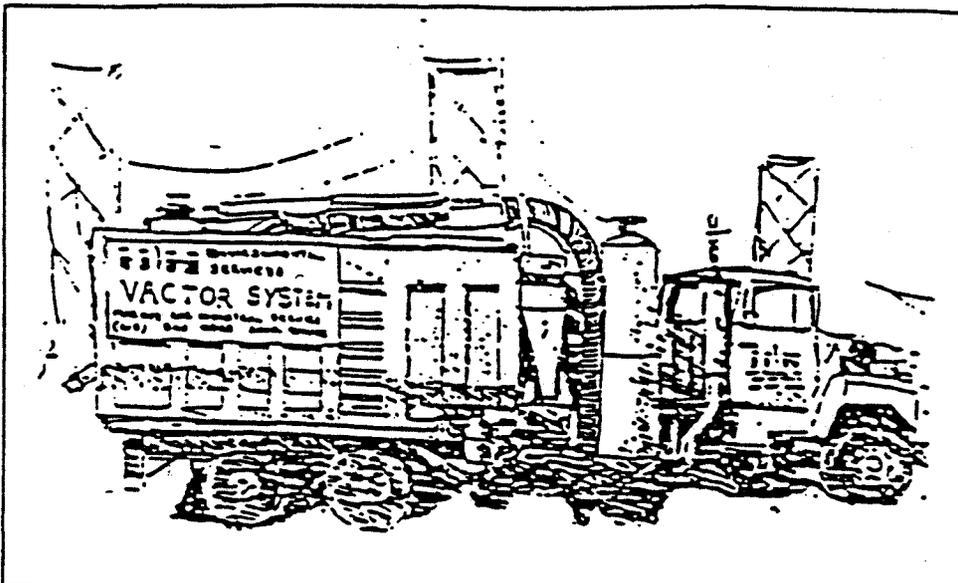
What's the Scoop

Catch Basin Cleaning (SC71 of California Storm Water BMP Handbook. 1993)

Housekeeping Practices (SC10 of California Storm Water BMP Handbook. 1993)

Building and Grounds Maintenance (SC11 of California Storm Water BMP Handbook. 1993)

BMP: Inlet Cleaning



Description

Inlet cleaning is the removal of sediment and debris from storm drain inlets. Storm water inlets can only operate efficiently if they are maintained on a regular basis. Parking lot maintenance should include regular cleaning to remove pollutants and to prevent clogging of inlets. Clogged inlets are not only useless, but may act as a source of increased sediment and pollutant levels in storm water runoff.

Inlet cleaning is usually conducted using one of two methods, manual cleaning or by vacuum truck. Manual cleaning is the removal of debris and sediment using shovels, trowels, buckets, etc. Manual cleaning is recommended for a few (5 or less) small sized inlets (approximately 3' x 3' x 3').

For greater than 5 small inlets or large sized inlets, the vacuum truck method should be used. The vacuum truck method includes manual removal of debris (trash, branches, etc.) followed by removal of sediment and/or water with a vacuum truck. A vacuum truck company in your area can be found in the Yellow Pages under Sewer Contractors or Pumping Contractors. Wastes need to be wet or moist for vacuum truck to work.

It should be noted that sediment (less the debris) removed from the catch basin should be analyzed for disposal. At a minimum, sediment should be analyzed for lead, oil & grease, and hydrocarbons.

Conditions Where BMP Applies

Inlet cleaning should be implemented in any parking lot that has a storm water inlet.

Costs

Costs are dependent upon the level of cleaning required for the inlet and the number of inlets requiring cleaning. Manual cleaning of a small inlet requires approximately 1 hour of labor. The vacuum truck method requires approximately 1/2 hour per inlet at a cost of \$70 per hour. Additional costs are expected for analyses of the sediment, approximately \$50 per constituent (lead, oil & grease, etc.) and for disposal of the sediment.

Applicability Small Parking Lots

Frequency

- ● Small, high turnover rate, no landscaping
- ● Small, low turnover rate, no landscaping

Large Parking Lots

Frequency

- ● Large, high turnover rate, no landscaping
- ● Large, high turnover rate, landscaping available
- ● Large, low turnover rate, no landscaping
- ● Large, low turnover rate, landscaping available

Availability

- Commercially
- Requires fabrication (off-site)
- On-site fabrication
- Excavation

Costs/Yr

- < \$1000
- 1K-5K
- 5K-20K
- > 20K

Inspection Frequency

- Storm Event
- Monthly during wet season
- Before wet season
- 2-3 years

Equipment

Small storm water inlets can be cleaned manually by using shovels, trowels, etc. Larger inlets, however, usually require mechanical cleaning equipment such as vacuum trucks or bucket loaders.

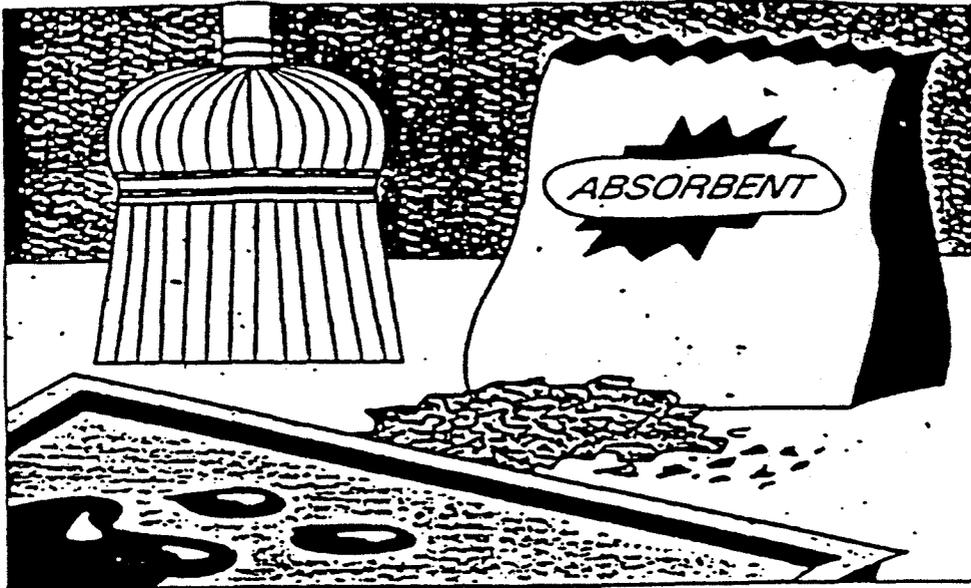
Inspection and Maintenance

Activity	Frequency	Level of Effort
Remove debris and sediment from inlet	Before wet season	Manual cleaning method: one person, 1 hour/inlet or Vacuum Truck Method: One vacuum truck crew (Operator & Truck) 1/2 hour /inlet at \$70/hr.

Other

Periodic cleaning of inlets maintains the inlet's capabilities for treating storm water. Lack of cleaning has been established as one of the major causes for storm water inlet failures (e.g. flooding).

BMP: Spot Cleaning



Description

Spot cleaning is the application of absorbent materials to spilled or leaked automotive or similar fluids (i.e. gasoline, oil, antifreeze). Spot cleaning is conducted by placing an absorbent material over a spill, allowing the spilled material to be soaked up then sweeping up the absorbent and placing it into a container for reuse or disposal. Examples of absorbent materials include rice hull ash, kitty litter or sawdust.

Conditions Where BMP Applies

Absorbents can be used in any parking lot where leaks are observed, on wet areas or in frequently used stalls. Absorbents are capable of absorbing any spilled liquid material, but are mainly used to absorb automotive type fluids (i.e. gasoline, oil, antifreeze).

Costs

Absorbents are inexpensive. A 20-lb. bag of absorbent costs approximately \$8. Spot cleaning involves low labor cost. Application requires one person approximately 15 min. per spot (assuming a spill or spot size of 2 - 3 feet in diameter or less). Additional costs are associated with disposal of the spent absorbent.

Other

Absorbent materials can be reused until the material becomes saturated with the spilled product. Saturation is evident when the material becomes dark w/product (i.e. black from motoroil). If some of the original color of the absorbent can be seen, the material still has absorbing capabilities.

Saturated absorbent material should be collected in approved disposal containers, and disposed of properly. In some jurisdictions, oil-soaked absorbent is considered a hazardous waste. Check with your local administering agency (usually Department of Health).

Applicability Small Parking Lots

Example Site

- ● Small, high turnover rate, no landscaping
- ● Small, low turnover rate, no landscaping

Large Parking Lots

Example Site

- ● Large, high turnover rate, no landscaping
- ● Large, high turnover rate, landscaping available
- ● Large, low turnover rate, no landscaping
- ● Large, low turnover rate, landscaping available

Availability

- Commercially
- Requires fabrication (off-site)
- On-site fabrication
- Excavation

Costs/Yr

- < \$1000
- 1K-5K
- 5K-20K
- > 20K

Inspection Frequency

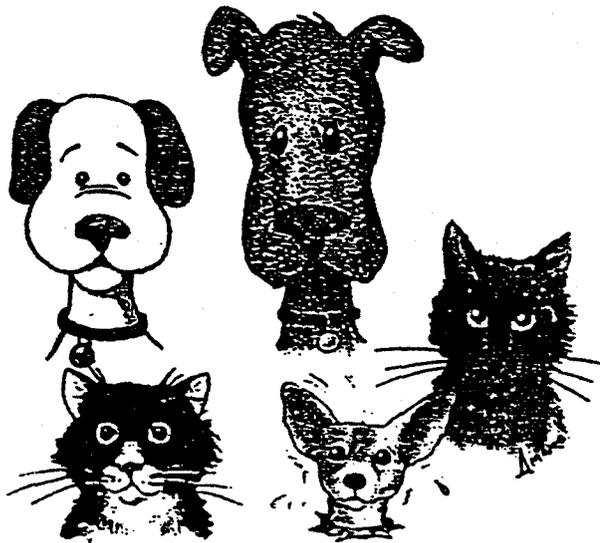
- Storm Event
- Monthly during wet season
- Before wet season
- 2-3 years



What's the Scoop?

Tips for a healthy pet
and a healthier environment

Consejos para animales domésticos
y un medio ambiente más sano



Create a healthy environment in and around your home by following these simple pet practices. Your pet, family and neighbors will appreciate their clean comfortable surroundings.

For more information on City of Los Angeles services for a healthy pet and a healthier environment, please call the phone numbers listed in this pamphlet.

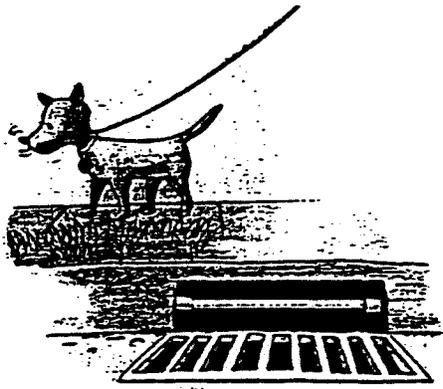
Cree un medio ambiente sano en su casa y sus alrededores siguiendo estos sencillos consejos con su animal doméstico. Tanto su animal doméstico, como su familia y vecinos agradecerán disfrutar de un ambiente limpio y confortable.

Para más información sobre los servicios que ofrece la Ciudad de Los Angeles para animales domésticos y un medio ambiente más sano, por favor llame a los números de teléfono que se indican en este folleto.



Maintain your automobile and dispose of used fluids properly. Pets can be poisoned if they ingest gas, oil or antifreeze that drips onto the pavement or is stored in open containers. Call the Household Hazardous Waste Hotline for information on proper disposal.

Cuide su automóvil y elimine los residuos líquidos de forma adecuada. Los animales domésticos se pueden envenenar si inhalan gases, o ingieren aceites y líquidos anticongelantes que gotean al pavimento o que se guardan en envases abiertos. Llame al número de Teléfono de Información sobre Desperdicios Domésticos Peligrosos para recibir información sobre formas apropiadas de eliminación de residuos líquidos.



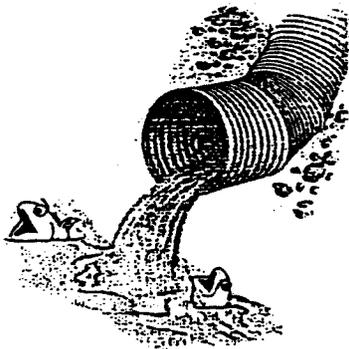
When walking your dog, always carry a pooper scooper or plastic bag with you to pick up your pet's waste. It is a neighborhood nuisance that can wash into gutters and storm drains carrying dangerous diseases into our rivers and ocean (L.A.M.C. Sec. 53.49).

Properly dispose of pet waste by flushing it down the toilet or placing it in the trash.

Cuando saque su perro a pasear, lleve siempre con usted un recogedor de desperdicios o una bolsa de plástico para recoger los desechos de su animal doméstico. Resulta una molestia para su vecino que además puede ir a parar a los arroyos y alcantarillas y enfermedades peligrosas a nuestros ríos y océanos.

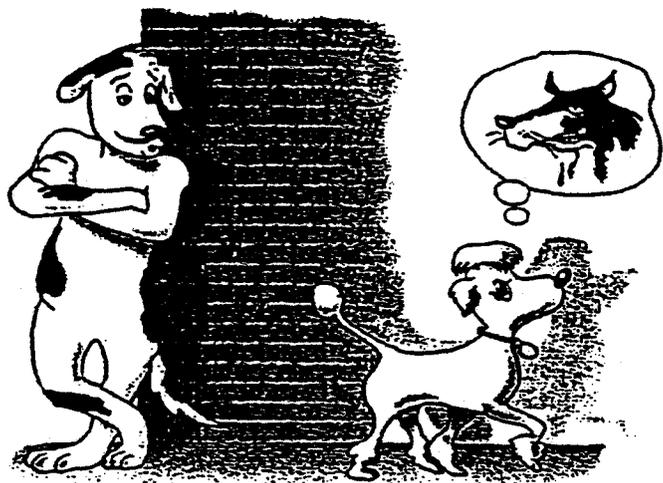
(también es en violación del Código Municipal de Los Angeles, Art. 53.49).

Elimine de forma apropiada los desechos de los animales domésticos depositándolos en el inodoro o tirándolos a la basura.



Spay or neuter your pets. There aren't enough homes for the many puppies and kittens born each day. Low-cost spay and neuter vouchers are available from the City of Los Angeles Department of Animal Services.

Vaccinate your pets to protect them from disease. License your pets to protect them from loss. Vaccination clinics and dog licenses are available through the City of Los Angeles Department of Animal Services.



Castre o extirpe los ovarios de sus animales domésticos. No hay suficientes hogares para todos los cachorros y gatitos que nacen cada día. El Departamento de Servicios de los Animales de la Ciudad de Los Angeles tiene a su disposición cupones de bajo costo para la castración y extirpación de los ovarios de los animales domésticos.

Vacune a sus animales domésticos para protegerlos de las enfermedades. Registre y obtenga chapas de identificación para sus animales domésticos para evitar perderlos. Las clínicas de vacunación y las chapas de identificación para perros se encuentran disponibles a través del Departamento de Servicios de los Animales de la Ciudad de Los Angeles.

● **C**hange your pet's food and water regularly to avoid pest infestation. Leftover food in and around your home can attract unwanted pests, insects and disease.



● **C**ambie el agua y la comida de su animal frecuentemente para evitar plagas. Las sobras de comida dejadas en su casa y en sus alrededores pueden atraer plagas, insectos y enfermedades no deseadas.

Adopt a pet and save a life: A variety of animals, from purebreds to mixed breeds are waiting at the City of Los Angeles Animal Services Center for loving arms and good homes.



Adopte un animal doméstico y salvele la vida. El Centro de Servicios de Animales de la Ciudad de Los Angeles tiene una gran variedad de animales, desde animales de raza a los de mezcla, que esperan ser acogidos por unos brazos cariñosos y buenos hogares.

BMP: CATCH BASIN CLEANING



Program Elements

- New Development*
- Residential*
- Commercial Activities*
- Industrial Activities*
- Municipal Facilities*
- Illegal Discharges*

DESCRIPTION

Maintain catch basins and storm water inlets on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, and restore the catch basins' sediment trapping capacity. A catch basin is distinguished from a storm water inlet by having at its base a sediment sump designed to catch and retain sediments below the overflow point. This fact sheet focuses on the cleaning of accumulated sediments from catch basins.

APPROACH

- Aggressively enforce anti-littering and illegal dumping ordinances.
- Catch basins should be cleaned regularly to reduce the possibility of sediment and pollutant loading from the flushing effect of storm water inflow.
- Prioritize maintenance to clean catch basins and inlets in areas with the highest pollutant loading.
- Keep accurate operation logs to track program.

REQUIREMENTS

- **Cost Considerations**
 - An aggressive catch basin cleaning program could require a significant capital and O&M budget. A careful study of cleaning effectiveness should be undertaken before increased cleaning is implemented.
- **Regulations**
 - There are no regulatory requirements for this BMP. Municipal codes should include sections prohibiting the disposal of soil, debris, refuse, hazardous waste, and other pollutants into the storm drain system, and prohibiting littering.
- **Administrative / Staffing**
 - Two-person teams may be required to clean catch basins with vector trucks.
 - Arrangements must be made for proper disposal of collected wastes.
- **Equipment**
 - Except for small communities with relatively few catch basins that may be cleaned manually, most municipalities will require mechanical cleaners such as eductors, vacuums, or bucket loaders.
- **Training**
 - Crews must be trained in proper maintenance, including record keeping and disposal.

PUBLIC EDUCATION / PARTICIPATION

- Educate contractors (cement, masonry, painting) and utility employees (telephone, cable, gas and electric) about proper waste (solid and liquid) disposal.

LIMITATIONS

- There are no major limitations to this best management practice.

Targeted Constituents

- Sediment*
 - Nutrients*
 - Heavy Metals*
 - Toxic Materials*
 - Floatable Materials*
 - Oxygen Demanding Substances*
 - Oil & Grease*
 - Bacteria & Viruses*
- Likely to Have Significant Impact*
 - Probable Low or Unknown Impact*

Implementation Requirements

- Capital Costs*
 - O&M Costs*
 - Regulatory*
 - Staffing*
 - Training*
 - Administrative*
- High* *Low*

SC71



Additional Information — Catch Basin Cleaning

Regular maintenance of public and private catch basins and inlets is necessary to ensure their proper functioning. Clogged catch basins are not only useless but may act as a source of sediments and pollutants. In general, the keys to effective catch basins are:

- At least annual inspections. Municipal staff should inspect public and private facilities to ensure compliance with the following:
 - Immediate repair of any deterioration threatening structural integrity.
 - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
 - Stenciling of catch basins and inlets (see SC30, Storm Drain System Signs).
- Clean catch basins in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.
- Keep accurate logs of the number of catch basins cleaned.
- Record the amount of waste collected.
- Consider implementing employee deputization and spill tracking measures in SC50, Illegal Dumping Control, in conjunction with this BMP to facilitate control of illegal dumping.

Public education should be implemented in conjunction with the public education effort in SC50, Illegal Dumping Control, to raise awareness of the problem. Information in the Construction Handbook regarding waste management (BMPs CA20-CA24) may be used to develop a program for contractors.

REFERENCES

Best Management Practices for Storm Drainage Facilities (Draft), Maintenance Subcommittee, Alameda County Urban Runoff Clean Water Program, 1992.

Protecting Water Quality in Urban Areas: Best Management Practices for Minnesota, Minnesota Pollution Control Agency, 1989.

Stormwater Management Manual for the Puget Sound Basin (The Technical Manual): Volume IV - Urban Land Use BMPs, Washington State Department of Ecology, 1992.

Street Cleaning Practice, American Public Works Association, 1978.

SC71



BMP: HOUSEKEEPING PRACTICES

Graphic: North
Central Texas
COG, 1993



Program Elements

New Development

Residential

Commercial Activities

Industrial Activities

Municipal Facilities

Illegal Discharges

DESCRIPTION

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals. Related information is provided in BMPs SC11, Safer Alternative Products; SC31, Household Hazardous Waste Collection; SC32, Used Oil Recycling; and the Spill Prevention and Cleanup BMPs (SC40/SC41). For information on specific activities at municipal facilities, see Chapter 4, Industrial Handbook.

APPROACH

- Pattern a new program after the many established programs from municipalities around the state and country. Integrate this best management practice as much as possible with existing programs at your municipality.
- This BMP has two key audiences, municipal employees and the general public.
- Implement this BMP in conjunction with SC11, Safer Alternative Products.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.1, SC50, Illegal Dumping Control.

REQUIREMENTS

- Cost Considerations
 - The primary cost is for staff time as noted below.
- Regulations
 - There are no regulatory requirements to this BMP. Existing regulations already require municipalities to properly store, use, and dispose of hazardous materials.
- Administrative / Staffing
 - Staff to train municipal employees and to coordinate public education efforts.
- Equipment
 - There are no major equipment requirements to this BMP.
- Training
 - Municipal employees who handle potentially harmful materials should be trained in good housekeeping practices. Personnel who use pesticides must be trained in their use. The California Department of Pesticide Regulation license pesticide dealers, certify pesticide applicators and conduct on-site inspections.

PUBLIC EDUCATION / PARTICIPATION

- Public awareness is a key to this BMP.

LIMITATIONS

- There are no major limitations to this best management practice.

Targeted Constituents

- Sediment
 - Nutrients
 - Heavy Metals
 - Toxic Materials
 - Floatable Materials
 - Oxygen Demand-
ing Substances
 - Oil & Grease
 - Bacteria & Viruses
- Likely to Have
Significant Impact
 - Probable Low or
Unknown Impact

Implementation Requirements

- Capital Costs
 - O&M Costs
 - Regulatory
 - Staffing
 - Training
 - Administrative
- High Low

SC10



Best
Management
Practices

Additional Information — Housekeeping Practices

Municipal facilities should follow the best management practices outlined in Chapter 4 of the Industrial Handbook, most of which include good housekeeping measures. Municipalities should develop controls on the application of pesticides, herbicides, and fertilizers in public right-of-ways and at municipal facilities. Controls may include:

- List of approved pesticides and selected uses;
- Product and application information for users;
- Equipment use and maintenance procedures; and
- Record keeping and public notice procedures.

For the general public, municipalities should establish a public education program that provides information on such items as storm water pollution and the beneficial effects of proper disposal on water quality; reading product labels; safer alternative products; safe storage, handling, and disposal of hazardous products; list of local agencies; and emergency phone numbers. The programs listed below have provided this information through brochures or booklets that are available at a variety of places including municipal offices, household hazardous waste collection events or facilities, and public information fairs.

The following discussion provides some general information on good housekeeping that may be provided to the general public. More specific information on particular chemicals may be found in the references listed below.

- Always use caution when handling any hazardous household product. Many products contain toxic chemicals that can cause severe injury or death.
- Store household hazardous products securely and away from children, pets, and sources of heat, sparks, and flames.
- Store products in their original containers and keep them well labeled. **Do not** store chemicals in food containers.
- Read and follow use instructions.
- Avoid contact with eyes and skin. Wear gloves and eye protection when using hazardous substances. **Do not** wear contact lenses which can absorb hazardous vapors.
- Work in only well ventilated areas.
- Use up all of the product before disposing or give extra to friends, neighbors or community groups.
- **Do not** dispose of household hazardous waste:
 - in trash,
 - down storm drains or into creeks,
 - down sink or toilet,
 - onto the ground, or
 - by burning.
- **Do** dispose of hazardous wastes at household hazardous waste collection events or facilities.

The California Integrated Waste Management Board's Recycling Hotline, 1-800-553-2962, provides information on household hazardous waste collection programs and facilities.

Examples of Effective Programs

There are a number of communities with effective programs. The most pro-active include Santa Clara County and the City of Palo Alto, the City and County of San Francisco, and the Municipality of Metropolitan Seattle (Metro).

REFERENCES

The Bay Begins at Your Door (Brochure), Santa Clara Valley Nonpoint Source Pollution Control Program. (No date).

Guide to Hazardous Products Around the Home (Booklet), Household Hazardous Waste Project, 1989.

SC10



Additional Information — Housekeeping Practices

Hazardous Household Products: A Guide to the Disposal of Hazardous Household Products and the Use of Non-Hazardous Alternatives, California Department of Toxic Substance Control.

Household Cleaners and Polishes, Chemical Hazards in the Home (Brochure), Golden Empire Health Planning Center, (No date).

Solvents, Chemical Hazards in the Home (Brochure), Golden Empire Health Planning Center, (No date).

Take Me Shopping: A Consumer Guide to Safe Alternatives for Household Hazardous Products (Booklet), Santa Clara County and City of Palo Alto, 1992.

Your Guide to Less Toxic Shopping: Safer Alternatives for Your Home and Life! (Booklet), San Francisco Household Hazardous Waste Program, 1992.

SC10



ACTIVITY: BUILDING AND GROUNDS MAINTENANCE

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from buildings and grounds maintenance by washing and cleaning up with as little water as possible, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the storm water collection system.

APPROACH

- Leaving or planting native vegetation to reduce water, fertilizer, and pesticide needs.
- Careful use of pesticides and fertilizers in landscaping.
- Integrated pest management where appropriate.
- Sweeping of paved surfaces.
- Cleaning of the storm drainage system at appropriate intervals.
- Proper disposal of wash water, sweepings, and sediments.
- For a quick reference on disposal alternatives for specific wastes see Table 4.1, SC1.

REQUIREMENTS

- Costs (Capital, O&M)
 - Cost will vary depending on the type and size of facility.
 - Overall costs should be low in comparison to other BMPs.
- Maintenance
 - The BMPs themselves relate to maintenance and do not require maintenance as they do not involve structures.

LIMITATIONS

- Alternative pest/weed controls may not be available, suitable, or effective in every case.

Applications

Manufacturing
 Material Handling
 Vehicle Maintenance
 Construction

Commercial Activities

Roadways

Waste Containment

Housekeeping Practices

Targeted Constituents

- Sediment
- Nutrients
- Heavy Metals
- Toxic Materials
- Floatable Materials
- Oxygen Demanding Substances
- Oil & Grease
- Bacteria & Viruses

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training

- High
- Low

SC11



Additional Information — Building and Grounds Maintenance

Buildings and grounds maintenance includes taking care of landscaped areas around the facility, cleaning of parking lots and pavement other than in the area of industrial activity, and the cleaning of the storm drainage system. Painting and other minor or major repairs of buildings is covered in SC12 (Building Repair, Remodeling, and Construction). Certain normal maintenance activities can generate materials that must be properly disposed. Other maintenance activities can enhance water quality if they are carried out more frequently and/or in a more deliberate fashion.

Pesticide/Fertilizer Management

Landscape maintenance involves the use of pesticides and fertilizers. Proper use of these materials will reduce the risk of loss to storm water. In particular, do not apply these materials during the wet season as they may be carried from the site by the next storm. When irrigating the landscaped areas, avoid over-watering not only to conserve water but to avoid the discharge of water which may have become contaminated with nutrients and pesticides.

It is important to properly store pesticides and application equipment, and to dispose the used containers in a responsible manner, consistent with state regulations. Personnel who use pesticides should be trained in their use. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct on-site inspections.

Written procedures for the use of pesticides and fertilizers relevant to your facility would help maintenance staff understand the "do's" and "don'ts". If you have large vegetated areas, consider the use of integrated pest management (IPM) techniques to reduce the use of pesticides.

Parking/Storm Sewer Maintenance

A parking area that drains to the same storm drainage system as the industrial activity that is to be permitted must also be evaluated for suitable BMPs. Storm water from parking lots may contain undesirable concentrations of oil, grease, suspended particulates, and metals such as copper, lead, cadmium, and zinc, as well as the petroleum byproducts of engine combustion. Deposition of air particulates, generated by the facility or by adjacent industries, may contribute significant amounts of pollutants.

The two most appropriate maintenance BMPs are periodic sweeping and cleaning catch basins if they are part of the drainage system. A vacuum sweeper is the best method of sweeping, rather than mechanical brush sweeping which is not as effective at removing the fine particulates.

Catch basins in parking lots generally need to be cleaned every 6 to 12 months, or whenever the sump is half full. A sump that is more than half full is not effective at removing additional particulate pollutants from the storm water. If the storm drain lines have a low gradient, less than about 0.5 feet in elevation drop per 100 feet of line, it is likely that material is settling in the lines during the small, frequent storms. If you have not cleaned the storm drain system for some time, check the lines as well. If they are not cleaned, the catch basins will likely be filled during the next significant storm by material that is washed from the lines. Also, install "turn-down" elbows or similar devices on the outlets of the catch basins; they serve to retain floatables, oil and grease.

Clearly mark the storm drain inlets, either with a color code (to distinguish from process water inlets if you have them) or with the painted stencil of "DO NOT DUMP WASTE". This will minimize inadvertent dumping of liquid wastes.

Sweepings and sediments from these maintenance activities are generally low in metals and other pollutants and therefore can be disposed on-site or to a construction debris landfill. Test the material if there is a reasonable doubt whether metals or other pollutants are present. If concentrations of contaminants are high, it indicates that other BMPs may be needed to eliminate or reduce emissions from the source. If a vacuum truck is used to clean the storm drainage system,

SC11



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E. GENERAL BUSINESS PROCEDURES/BMPs

Your Business and the County Partners in Protecting the Ocean

Good Cleaning Practices

Quick Reference Table of Disposal Alternatives

Spill Prevention and Control (CA12 of California Storm Water BMP Handbook)

Best Management Practices for Industrial Storm Water Pollution Control

Employee Training (SC14 of California Storm Water BMP Handbook)

YOUR BUSINESS AND THE COUNTY PARTNERS IN PROTECTING THE OCEAN

Steps You Can Take Now

COVER AREAS WHERE POTENTIAL POLLUTANTS ARE STORED.

Pollutants such as trash, grease, paints, detergents and metals can come into contact with storm water or water from other sources and create polluted runoff. Keep these materials covered, labeled and stored in appropriate containers.

SEAL LEAKING STORAGE AND DUMPSTER CONTAINERS.

Prevent substances like grease, liquids and food products from coming into contact with rainfall and entering the storm drains.

PREVENT SPILLS AND LEAKS

Maintain a regular inspection and repair schedule for vehicles and equipment. Take appropriate precautions in loading and unloading materials. Look for and correct any potential leaks or spills.

DEVELOP PLANS TO MANAGE SPILLS SHOULD THEY OCCUR.

Propose a Spill Contingency Plan for hazardous spills, or an Accident Spill Plan for food or other spills. Clean any spills promptly, not allowing them to evaporate. Clean spills without water whenever possible. Rags, damp mops, and dry, absorbent materials are recommended for clean up. Dispose of any spill waste and clean-up materials promptly and legally.

KNOW YOUR WASTE HAULER'S PRACTICES.

Avoid waste haulers that accept your payment and dump your waste illegally. You are liable for illegal dumping of your waste. Your waste should be disposed of at a landfill if not hazardous or other appropriate facility.

SWEEP PARKING LOTS AND OUTDOOR STORAGE AREAS REGULARLY.

Sweep these areas at least once per week to maintain a debris-free facility. Dispose of debris, do not sweep it into the gutter. Never hose off paved surfaces.

LANDSCAPE MAINTENANCE

Pick up and properly dispose of waste; don't allow waste to be blown into the street gutter. Avoid over-irrigation and over-application of herbicides and pesticides that could create run-off to the storm drains.

RECYCLE OR DISPOSE OF FLUIDS PROPERLY.

Many automotive fluids can be recycled, others must be disposed of as hazardous materials. For photo processors, treat spent chemicals on site, if possible, to remove silver.

WASH VEHICLES AND EQUIPMENT IN DESIGNATED AREAS ONLY.

Wash areas must be paved and fitted to drain only to sanitary sewers. A commercial car wash may be an alternative if your facility is not properly equipped.

LABEL STORM DRAIN INLETS.

Stenciling storm drains with "No Dumping! Drains to Ocean." alerts employees and customers that no dumping is allowed. Contact Marti, NPDES Coordinator, for information on stenciling of storm drains near your facility: (714) 834-3526.

INSPECT STORM DRAIN INLETS PERIODICALLY.

Prevent accumulated pollutants from washing down storm drains on your property and periodically inspect, remove and properly dispose of any debris.

CHECK FOR AND CORRECT ILLICIT CONNECTIONS TO STORM DRAINS.

Any discharged waste water must be carried by the sanitary sewer to a treatment plant, never by storm drains to the ocean.

EDUCATE CUSTOMERS AND TRAIN EMPLOYEES TO IMPLEMENT STORM WATER MANAGEMENT PRACTICES.

Post notices of appropriate practices, provide convenient labeled, covered, disposal containers and train employees to implement these management practices.

ADDITIONAL INFORMATION.

The California Integrated Waste Management Board Recycling Hotline offers information on local recycling services: (800) 553-2952.

If you would like more information about the County of Orange Clean Storm Water Program and Best Management Practices (BMPs), please call Marti Guerra Serizawa, NPDES Coordinator, Subdivision and Grading, NPDES Section, at (714) 834-3526.

Good Cleaning Practices



Clean floor mats, filters and garbage cans in a mop sink, floor drain or proper outside area. Don't wash them in a parking lot, alley, sidewalk or street.

Limpie los tapetes de piso, los filtros y los botes de basura en un fregadero para trapeadores, desagüe de piso o en algún sitio apropiado afuera.

No los lave en los estacionamientos, callejones, veredas o en la calle.



Pour washwater into a janitorial or mop sink. Don't pour it out onto a parking lot, alley, sidewalk or street.

Arroje el agua empleada en la limpieza al fregadero para trapeadores. No la arroje en los estacionamientos, callejones, veredas o en la calle.



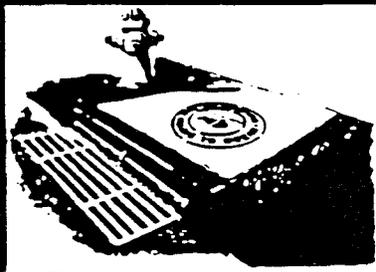
Recycle grease and oil. Don't pour it into sinks, floor drains, or onto a parking lot or street.

Recicle grasa y aceite. No los arroje en lavaderos o desagües de piso ni en estacionamientos o calles.



Keep dumpster area clean and lid closed. Don't fill it with liquid waste or hose it out.

Mantenga el área alrededor del basurero limpia y la tapa cerrada. No lo llene con desperdicios líquidos ni utilice la manguera.



Use dry methods for spill cleanup (sweeping, cat litter, etc.). Don't hose down spills.

Use métodos secos para limpiar los derrames (escobas, aserrín de los gatos, etc.). No utilice mangueras para limpiar los derrames.

For A Cleaner Ocean



QUICK REFERENCE TABLE FOR DISPOSAL ALTERNATIVES
 (Adopted from Santa Clara County Nonpoint Source Solution Control Program — December 1992)

All of the waste products on this chart are prohibited from discharge to the storm drain system. Use this matrix to decide which alternative disposal strategies to use. **ALTERNATIVES ARE LISTED IN PRIORITY ORDER.**

- Key: IIIW Household hazardous waste (Government-sponsored drop-off events)
 POTW Publicly Owned Treatment Plant
 Reg. Bd. Regional Water Quality Control Board (Oakland)
 "Dispose to sanitary sewer" means dispose into sink, toilet, or sanitary sewer clean-out connection.
 "Dispose as trash" means dispose in dumpsters or trash containers for pickup and/or eventual disposal in landfill.
 "Dispose as hazardous waste" for business/commercial means contract with a hazardous waste hauler to remove and dispose.

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
General Construction and Paint; Street and Utility Maintenance			
Excess paint (oil-based)	1. Recycle/reuse. 2. Dispose as hazardous waste.		1. Recycle/reuse. 2. Take to IIIW drop-off.
Excess paint (water-based)	1. Recycle/reuse. 2. Dry residue in cans, dispose as trash. 3. If volume is too much to dry, dispose as hazardous waste.		1. Recycle/reuse. 2. Dry residue in cans, dispose as trash. 3. If volume is too much to dry, take to IIIW drop-off
Paint cleanup (oil-based)	Wipe paint out of brushes, then: 1. Filter & reuse thinners, solvents. 2. Dispose as hazardous waste.		Wipe paint out of brushes, then: 1. Filter & reuse thinners, solvents. 2. Take to IIIW drop-off.
Paint cleanup (water-based)	Wipe paint out of brushes, then: 1. Rinse to sanitary sewer.		Wipe paint out of brushes, then: 1. Rinse to sanitary sewer.
Empty paint cans (dry)	1. Remove lids, dispose as trash.		1. Remove lids, dispose as trash.
Paint stripping (with solvent)	1. Dispose as hazardous waste.		1. Take to IIIW drop-off.
Building exterior cleaning (high-pressure water)	1. Prevent entry into storm drain and remove offsite 2. Wash onto dirt area, spade in 3. Collect (e.g., mop up) and discharge to sanitary sewer	POTW	
Cleaning of building exteriors which have HAZARDOUS MATERIALS (e.g., mercury, lead) in paints	1. Use dry cleaning methods 2. Contain and dispose washwater as hazardous waste (Suggestion: dry material first to reduce volume)		

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
General Construction and Paint; Street and Utility Maintenance (cont'd)			
Non-hazardous paint scraping/sand blasting	1. Dry sweep, dispose as trash		1. Dry sweep, dispose as trash
HAZARDOUS paint scraping/sand blasting (e.g., marine paints or paints containing lead or tributyl tin)	1. Dry sweep, dispose as hazardous waste		1. Dry sweep, take to IIIIW drop-off
Soil from excavations during periods when storms are forecast	1. Should not be placed in street or on paved areas 2. Remove from site or backfill by end of day 3. Cover with tarpaulin or surround with hay bales, or use other runoff controls (e.g., sandbags) 4. Place filter mat over storm drain Note: Thoroughly sweep following removal of dirt in all four alternatives.		
Soil from excavations placed on paved surfaces during period when storms are not forecast	1. Keep material out of storm conveyance systems and thoroughly remove via sweeping following removal of dirt 2. Surround with sandbags		
Cleaning streets in construction areas	1. Dry sweep and minimize tracking of mud 2. Use silt ponds and/or similar pollutant reduction techniques when flushing pavement		
Soil erosion, sediments	1. Cover disturbed soils, use erosion controls, block entry to storm drain. 2. Seed or plant immediately.		
Fresh cement, grout, mortar	1. Use/reuse excess 2. Dispose to trash		1. Use/reuse excess 2. Dispose to trash
Washwater from concrete/mortar (etc.) cleanup	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer	POTW	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer
Aggregate wash from driveway/patio construction	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer	POTW	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
General Construction and Paint; Street and Utility Maintenance (cont'd)			
Rinsewater from concrete mixing trucks	<ol style="list-style-type: none"> 1. Return truck to yard for rinsing into pond or dirt area 2. At construction site, wash into pond or dirt area lined with plastic and bermed, or surrounded with sandbags 		
Non-hazardous construction and demolition debris	<ol style="list-style-type: none"> 1. Recycle/reuse (concrete, wood, etc.) 2. Dispose as trash 		<ol style="list-style-type: none"> 1. Recycle/reuse (concrete, wood, etc.) 2. Dispose as trash
Hazardous demolition and construction debris (e.g., asbestos)	<ol style="list-style-type: none"> 1. Dispose as hazardous waste 		<ol style="list-style-type: none"> 1. Do not attempt to remove yourself. Contact asbestos removal service for safe removal and disposal 2. Very small amounts (less than 5 lbs.) may be double-wrapped in plastic and take to HHW drop-off
Saw-cut slurry	<ol style="list-style-type: none"> 1. Use dry cutting technique and sweep up residue 2. Vacuum slurry and dispose off-site. 3. Block storm drain or berm with low weir as necessary to allow most solids to settle. Shovel out gutters; dispose residue to dirt area, construction yard or landfill. 		
Construction dewatering (Nonturbid, uncontaminated groundwater)	<ol style="list-style-type: none"> 1. Recycle/Reuse 2. Discharge to storm drain 		
Construction dewatering (other than nonturbid, uncontaminated groundwater)	<ol style="list-style-type: none"> 1. Recycle/Reuse 2. Discharge to sanitary sewer 3. As appropriate, treat prior to discharge to storm drain 	POTW Reg. Bd.	
Portable toilet waste	<ol style="list-style-type: none"> 1. Leasing company shall dispose to sanitary sewer at POTW 	POTW	
Leaks from garbage dumpsters	<ol style="list-style-type: none"> 1. Collect, contain leaking material. Eliminate leak, keep covered, return to leasing company for immediate repair 2. If dumpster is used for liquid waste, use plastic liner 		

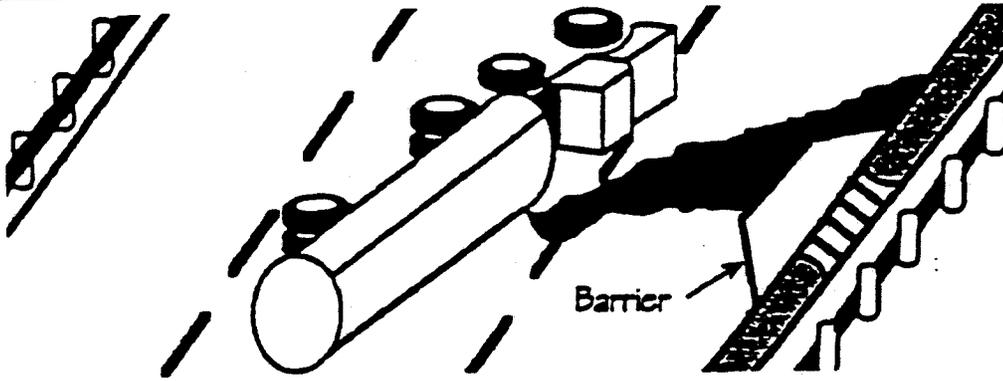
DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
General Construction and Paint; Street and Utility Maintenance (cont'd)			
Leaks from construction debris bins	1. Insure that bins are used for dry nonhazardous materials only (Suggestion: Fencing, covering helps prevent misuse)		
Dumpster cleaning water	1. Clean at dumpster owner's facility and discharge waste through grease interceptor to sanitary sewer 2. Clean on site and discharge through grease interceptor to sanitary sewer	POTW POTW	
Cleaning driveways, paved areas * (Special Focus - Restaurant alleys, Grocery dumpster areas) * Note: Local drought ordinances may contain additional restrictions	1. Sweep and dispose as trash (Dry cleaning only). 2. For vehicle leaks, restaurant/grocery alleys, follow this 3-step process: a. Clean up leaks with rags or absorbents. b. Sweep, using granular absorbent material (cat litter). c. Mop and dispose of mopwater to sanitary sewer (or collect rinse-water and pump to the sanitary sewer). 3. Same as 2 above, but with rinsewater (2c) (no soap) discharged to storm drain.		1. Sweep and dispose as trash (Dry cleaning only). 2. For vehicle leaks, restaurant/grocery alleys, follow this 3-step process: a. Clean up leaks with rags or absorbents; dispose as hazardous waste. b. Sweep, using granular absorbent material (cat litter). c. Mop and dispose of mopwater to sanitary sewer.
Steam cleaning of sidewalks, plazas * * Note: Local drought ordinances may contain additional restrictions	1. Collect all water and pump to sanitary sewer. 2. Follow this 3-step process: a. Clean oil leaks with rags or absorbents. b. Sweep (Use dry absorbent as needed). c. Use no soap, discharge to storm drain		
Potable water/line flushing Hydrant testing	1. Deactivate chlorine by maximizing time water will travel before reaching creeks		
Super-chlorinated (above 1 ppm) water from line flushing	1. Discharge to sanitary sewer 2. Complete dechlorination required before discharge to storm drain		

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
Landscape/Garden Maintenance			
Pesticides	<ol style="list-style-type: none"> 1. Use up. Rinse containers. Use rinsewater as product. Dispose rinsed containers as trash. 2. Dispose unused pesticide as hazardous waste. 		<ol style="list-style-type: none"> 1. Use up. Rinse containers. Use rinsewater as pesticide. Dispose rinsed containers as trash. 2. Take unused pesticide to IIIW drop-off.
Garden clippings	<ol style="list-style-type: none"> 1. Compost 2. Take to Landfill 		<ol style="list-style-type: none"> 1. Compost 2. Dispose as trash
Tree trimming	<ol style="list-style-type: none"> 1. Chip if necessary, before composting as recycling 		<ol style="list-style-type: none"> 1. Chip if necessary, before composting as recycling
Swimming pool, spa, fountain water (emptying)	<ol style="list-style-type: none"> 1. Do not use metal-based algicides (i.e., Copper Sulfate) 2. Recycle/reuse (e.g., irrigation) 3. Determine chlorine residue = 0, wait 24 hours and then discharge to storm drain. 	POTW	<ol style="list-style-type: none"> 1. Do not use metal-based algicides (i.e., Copper Sulfate) 2. Recycle/reuse (e.g., irrigation) 3. Determine chlorine residue = 0, wait 24 hours and then discharge to storm drain.
Acid or other pool/spa/fountain cleaning	<ol style="list-style-type: none"> 1. Neutralize and discharge to sanitary sewer 	POTW	
Swimming pool, spa filter backwash	<ol style="list-style-type: none"> 1. Reuse for irrigation 2. Dispose on dirt area 3. Settle, dispose to sanitary sewer 		<ol style="list-style-type: none"> 1. Use for landscape irrigation 2. Dispose on dirt area 3. Settle, dispose to sanitary sewer
Vehicle Wastes			
Used motor oil	<ol style="list-style-type: none"> 1. Use secondary containment while storing, send to recycler. 		<ol style="list-style-type: none"> 1. Put out for curbside recycling pickup where available 2. Take to Recycling Facility or auto service facility with recycling program 3. Take to IIIW events accepting motor oil
Antifreeze	<ol style="list-style-type: none"> 1. Use secondary containment while storing, send to recycler. 		<ol style="list-style-type: none"> 1. Take to Recycling Facility
Other vehicle fluids and solvents	<ol style="list-style-type: none"> 1. Dispose as hazardous waste 		<ol style="list-style-type: none"> 1. Take to IIIW event
Automobile batteries	<ol style="list-style-type: none"> 1. Send to auto battery recycler 2. Take to Recycling Center 		<ol style="list-style-type: none"> 1. Exchange at retail outlet 2. Take to Recycling Facility or IIIW event where batteries are accepted
Motor home/construction trailer waste	<ol style="list-style-type: none"> 1. Use holding tank. Dispose to sanitary sewer. 		<ol style="list-style-type: none"> 1. Use holding tank, dispose to sanitary sewer.

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
Vehicle Wastes (cont'd)			
Vehicle Washing	<ol style="list-style-type: none"> 1. Recycle 2. Discharge to sanitary sewer, never to storm drain 	POTW	<ol style="list-style-type: none"> 1. Take to Commercial Car Wash. 2. Wash over lawn or dirt area. 3. If soap is used, use a bucket for soapy water and discharge remaining soapy water to sanitary sewer.
Mobile Vehicle Washing	<ol style="list-style-type: none"> 1. Collect washwater and discharge to sanitary sewer 	POTW	
Vehicle leaks	<p>Follow this 3-step process:</p> <ol style="list-style-type: none"> 1. Clean up leaks with rags or absorbents 2. Sweep, using granular absorbent material (cat litter) 3. Mop and dispose of mopwater to sanitary sewer. 		
Other Wastes			
Carpet cleaning solutions & other mobile washing services	<ol style="list-style-type: none"> 1. Dispose to sanitary sewer 	POTW	<ol style="list-style-type: none"> 1. Dispose to sanitary sewer
Roof drains	<ol style="list-style-type: none"> 1. If roof is contaminated with industrial waste products, discharge to sanitary sewer 2. If no contamination is present, discharge to storm drain 		
Cooling water Air conditioning condensate	<ol style="list-style-type: none"> 1. Recycle/reuse 2. Discharge to sanitary sewer 	POTW	
Pumped groundwater, infiltration/ foundation drainage (contaminated)	<ol style="list-style-type: none"> 1. Recycle/reuse (landscaping, etc.) 2. Treat if necessary; discharge to sanitary sewer 3. Treat and discharge to storm drain 	Reg. Bd. POTW Reg. Bd.	
Fire fighting flows	If contamination is present, Fire Dept. will attempt to prevent flow to stream or storm drain		

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
Other Wastes (cont'd)			
Kitchen Grease	<ol style="list-style-type: none"> 1. Provide secondary containment, collect, send to recycler. 2. Provide secondary containment, collect, send to POTW via hauler. 	POTW	<ol style="list-style-type: none"> 1. Collect, solidify, dispose as trash
Restaurant cleaning of floor mats, exhaust filters, etc.	<ol style="list-style-type: none"> 1. Clean inside building with discharge through grease trap to sanitary sewer. 2. Clean outside in container or bermed area with discharge to sanitary sewer. 		
Clean-up wastewater from sewer back-up	<ol style="list-style-type: none"> 1. Follow this procedure: <ol style="list-style-type: none"> a. Block storm drain, contain, collect, and return spilled material to the sanitary sewer. b. Block storm drain, rinse remaining material to collection point and pump to sanitary sewer (no rinse-water may flow to storm drain) 		

ACTIVITY: SPILL PREVENTION AND CONTROL



Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, CA10 (Material Delivery and Storage) and CA11 (Material Use), also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this chapter.

APPROACH

The following steps will help reduce the storm water impacts of leaks and spills:

Define "Significant Spill"

Different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.

General Measures

Hazardous materials and wastes should be stored in covered containers or with plastic sheeting and protected from vandalism.

Place a stockpile of spill cleanup materials where it will be readily accessible.

Train employees in spill prevention and cleanup.

Designate responsible individuals.

Cleanup

Clean up leaks and spills immediately.

On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.

Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs for specific information.

Reporting

Report significant spills to local agencies, including the Fire Department.

Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High Low

CA12



ACTIVITY: SPILL PREVENTION AND CONTROL (Continue)

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

If maintenance must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.

Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.

Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.

Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

Place drip pans or absorbent materials under paving equipment when not in use.

Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.

Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

Oil filters disposed of in trash cans or dumpsters can leak oil and pollute storm water. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

If fueling must occur on-site, use designated and secured (e.g., bermed or with sandbags) areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.

Discourage "topping-off" of fuel tanks.

Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.

REQUIREMENTS

Costs (Capital, O&M)

- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance

- Keep ample supplies of spill control and cleanup materials on-site, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as chances occur in the types of chemicals on-site.

LIMITATIONS

If necessary, use a private spill cleanup company.

REFERENCES

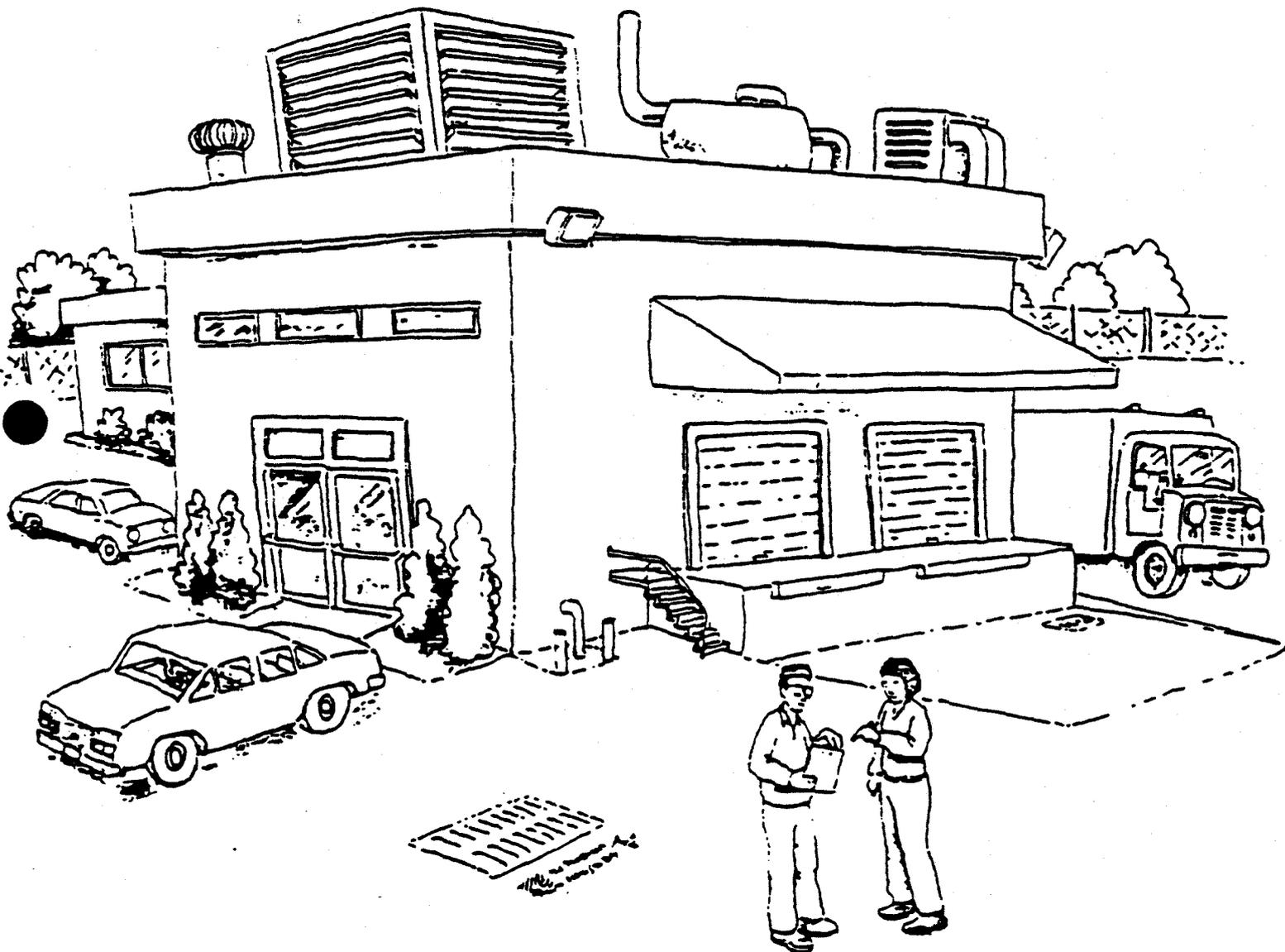
Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA12



Best Management Practices for Industrial Storm Water Pollution Control



Nonpoint Source
Pollution Control Program

1. Training and Education for Employees and Customers

Successful storm water pollution control relies in large part on proper training and education of employees. Many of the recommended BMPs in this part of the manual identify specific training needs for employees who conduct the activities. Train your employees in best management practices for storm water pollution control.

Train employees in these BMPs because a single employee's mistake or misunderstanding at the wrong time, in the wrong place, can lead to a costly pollution incident. When you have selected the BMPs that apply to your facility, add training in the BMPs to your regular employee training procedures.

Train employees to routinely inspect industrial activities and equipment that may be exposed to storm water. A once-a-week walk-through can help identify potential difficulties before they become major problems. Inspect structural BMPs to be sure that they continue to function properly.

Continue your training procedures in the future. Assign experienced workers to train new employees. Review procedures as a group at least once a year. You can coordinate this with worker safety training programs or "worker right-to-know" training for hazardous materials.

Periodically check employees' work practices to be sure the BMPs are implemented properly. Post informational and reminder signs, such as: proper equipment wash procedures at designated washing areas; "Close the cover" signs at dumpsters and other storage areas; and others. Stencil "No dumping! — flows to Bay" messages at storm drains. (Stencils are available from the NPS Program.)

Provide general information as well, because employees often respond best if they understand *why* they are being asked to conduct a new procedure. Employees' suggestions in return can help identify cost-effective storm water controls for your facility. Provide positive feedback so employees understand the difference they each make in protecting the Bay.

Emphasize the importance of keeping pollutants out of the storm drain, because the drains flow directly to streams and the Bay without benefit of the wastewater

treatment that the sanitary sewers receive. Educate plant personnel about the harmful environmental effects of improper disposal of materials into the storm drain, so they understand the importance of preventing storm water pollution. Also, educate employees on what they can do at home to reduce storm water pollution in the Bay. Public information pamphlets are available from your municipality.

If you subcontract for small construction jobs or other work on your premises, write contracts with your BMPs as conditions. Provide contractors with proper disposal options for wastes. Monitor contractors to be sure they comply with your BMPs.

To keep abreast of new developments, participate in workshops, trade association meetings, and seminars. Trade association publications can be valuable sources of information. Modify your practices whenever you find a new idea that serves your shop better.

If you serve customers at your facility, be aware of customer activities onsite. If they dispose of materials improperly, you will be responsible for the violation. Ask your customers not to discard liquids into your trash cans or storm drains. If you have persistent problems, you may need to monitor your customers more carefully at trash cans, storm drains, and other potential disposal areas on your property.

Let your customers know how you are minimizing wastes and recycling fluids to show that you are a "good neighbor," and encourage your customers to be the same. Showing clients what you are doing to protect the Bay is good public relations. Some businesses make the customer aware of their environmental requirements by including a modest environmental compliance fee, itemized on customers' billing statements, to cover handling and disposal costs for hazardous materials.



Label storm drain inlets so employees do not dispose waste there.

2. Eliminating Improper Discharges to Storm Drains

The Industrial Storm Water General Permit generally prohibits discharges of *anything but storm water* to the storm drains. There are many ways in which non-storm water from industrial plants can enter the storm drainage system. In most cases, the discharges result from practices that are now illegal, even though they may be inadvertent or may have been permissible in the past. Industrial process water, building wastewater, and water from other sources are prohibited, with a few exceptions described in Table 1. Inspect your facility and yard to be sure no unauthorized discharges enter your storm drains.

Unauthorized discharges take two forms. Illicit connections are improper permanent connections that allow wastewaters to enter storm drains, including some that may have been allowed in the past. Connections that allow sanitary or process wastewater to enter the storm drain are prohibited, including all storm drain connections from indoor drains or sinks. More information on identifying and removing illicit connections is available in the Santa Clara Valley NPS Program's Guide to Compliance with the General Permit.

Illegal dumping is water that has been exposed to industrial activities, and then released to the properly-connected storm drainage system. Pollutants may be introduced to storm drains inadvertently, by routine practices that discharge water outdoors; or by routinely discharging wastes, wash water, and other materials to storm drains, catch basins, and other conveyance facilities either on your property or in the street. A large part of this improper discharge results from employees' lack of understanding, coupled with a lack of readily-available proper routes for the discharge.

You need to make a long-term ongoing effort to assure that no illegal discharges will occur. This requires continuing observation to identify potential sources of intentional or inadvertent improper discharges. Discontinue or re-route the water from those activities. Continuing employee training will be needed. Measures to help prevent illegal discharges include:

- Provide well-marked proper disposal or collection methods for waste water wherever you frequently use wash water, discharge cooling water, or produce a liquid waste that might otherwise reach the storm drain.

- Employee training should especially emphasize proper disposal of non-storm water (see Section ...). Educate employees to understand that storm drains connect directly to streams and the Bay without treatment.
- Label all storm drain inlets and catch basins "No dumping—flows to Bay" so employees will know which inlets are part of the storm drain system.
- Periodically inspect and maintain storm drain inlets. Clean out catch basins so that accumulated pollutants do not wash down the storm drains.

Table 1 is a summary of a 3-page table included in the Storm Water Industrial General Permit for the Santa Clara Valley. The table identifies some common sources of water in industrial plants that can enter storm drains. For each source, the table lists the preferred disposal option for facilities in the Santa Clara Valley. For water that is allowable for discharge to the storm drain, Table 1 lists conditions or restrictions on discharge.

A few discharge categories of special interest are:

- **Cooling tower condensate** for industrial process water must be discharged to the sanitary sewer, with the appropriate permits.
- **Internal coolant** for refrigeration or building air conditioning is prohibited from the storm drains.
- **Building air conditioner condensate** may be discharged to the storm drain *only* if it is not treated with algae inhibitors, corrosion control chemicals, or other additives. Do not allow it to run across parking lots or other paved surfaces that may be contact pollutants on its way to the storm drain: use a pipe or trough to direct the flow. In most Santa Clara Valley cities, the preferred course is to discharge to the sanitary sewer. (Some cities have made this a legal requirement.)

3. Spill Prevention, Control, and Cleanup

Small spills can have cumulative effects that add up to a significant source of potential pollutants in your storm water discharge. The best approach by far is to prevent spills and leaks: maintain a regular inspection and repair schedule, and correct potential spill situations before a spill can occur. Some prevention techniques are described in Sections 4, 5, and 6.

When a spill does occur, quick and effective response is the best way to prevent pollutants from reaching storm water. Prepare a set of well-defined procedures for responding to a spill of any liquids in an area that might be exposed to storm water. The procedures can be specific for your facility, and should consider all circumstances from small, minor releases that can be easily handled to a large emergency spill — including who to call to respond to the situation before it gets out of hand. Train employees in the procedures (Section 1).

The basic procedures should emphasize that spills be cleaned up promptly, not allowed to evaporate. Otherwise, pollutants remain on the pavement and may be washed to the storm drains with the next rain, or will remain in the soil to become a possible groundwater pollutant. If the spill is on an unpaved surface, determine whether you need to remove the contaminated soil to prevent it from being a source of future storm water pollutants.

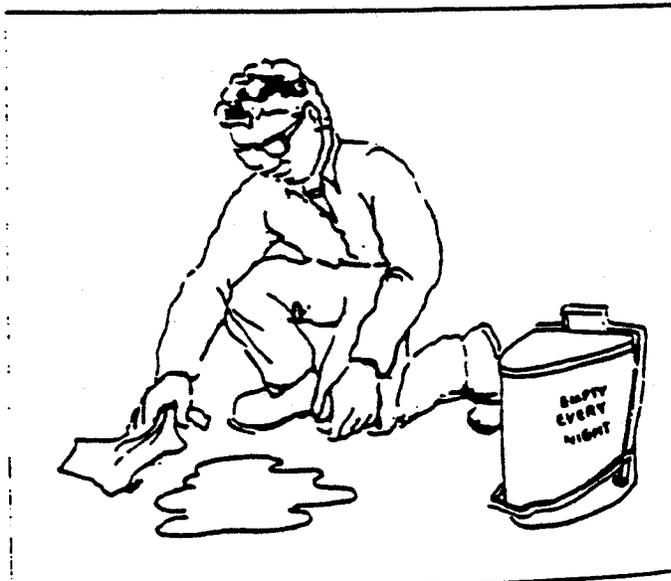
Also, the standard procedures should specify cleaning up leaks, drips, and other spills without water whenever possible. Do not use a hose or wet mop to clean up a spill area. Hosing may remove the spill from the immediate area, but does not keep the pollutant out of the environment. On the contrary, it adds to the volume of the spill and spreads the spilled material around a larger area.

If you handle hazardous materials, spill prevention and response procedures are described in your hazardous materials management plan, filed with your fire department or other hazardous materials ("Haz-Mat") authority (see Section 6). If a spill occurs, notify the authorities as required in your emergency response plan. Contain and collect the spilled substance, then dispose of the substances and any contaminated soil in compliance with hazardous materials regulations.

Small spills are those which can be wiped up with a shop rag. Don't put wet rags in the dumpster with the shop trash: store them in a covered rag bin, of the kind used at auto service stations. Avoid paper towels. You can avoid making this a waste stream by sending used rags to a professional cleaning service. (You need to inform your cleaning service of what the shop rags have been used for.) Do not saturate rags with gasoline, solvents, or other volatile liquids.

Medium-sized spills are too large to wipe up with a rag and require more attention. Contain and soak up the liquid using dry absorbent material such as vermiculite, specially-prepared sawdust, or "cat litter." Absorbent "snakes" may be used as temporary booms to contain and soak up the liquid. Sweep up the used absorbent and snakes and dispose of them appropriately: with the shop trash if non-hazardous, with the hazardous wastes if necessary. Another convenient option is to use a wet/dry shop vacuum cleaner to collect spills, and dispose of the liquid with your liquid or hazardous wastes. *Do not* use vacuums for gasoline, solvents or other volatile fluids, because the enclosed vacuum may become an explosion hazard.

Larger spills must be contained, then cleaned up. For spills of food waste or other non-hazardous liquid, take steps to contain and clean up the liquid, and minimize the wash water used in cleanup. Shut off or plug storm drain inlets or sewer inlets where the spill may enter. If necessary, keep temporary plugs on hand to fit your inlets and train employees in when and how to use them. For hazardous materials spills, implement your emergency procedures and alert your HazMat authority.



Wipe up small spills immediately with shop rags.

4. Outdoor Process Equipment Operations and Maintenance

Storm water from your site can accumulate pollutants by exposure to numerous small leaks, spills, and other discharges of outdoor equipment. Large equipment may require specially-designed structural or advanced BMPs to reduce the potential for storm water to contact pollutants. Ordinary precautions, such as those below, may suffice for smaller equipment.

As a first step, identify all equipment at your site that may be exposed to storm water, or may discharge potential pollutants that may be exposed to storm water. Identify the kinds of pollutants each piece of equipment may generate — lubricants, coolants, and other possible sources of leaks or discharges.

Be creative and thorough in developing your list. The inventory should include rooftop cooling towers or air conditioners; rooftop air vents for industrial equipment; outdoor air compressors and other service equipment; indoor wet processes where leaks or discharges may discharge to outdoor areas; and material transfer areas, such as loading areas where forklifts or trucks may carry pollutants outdoors on their tires.

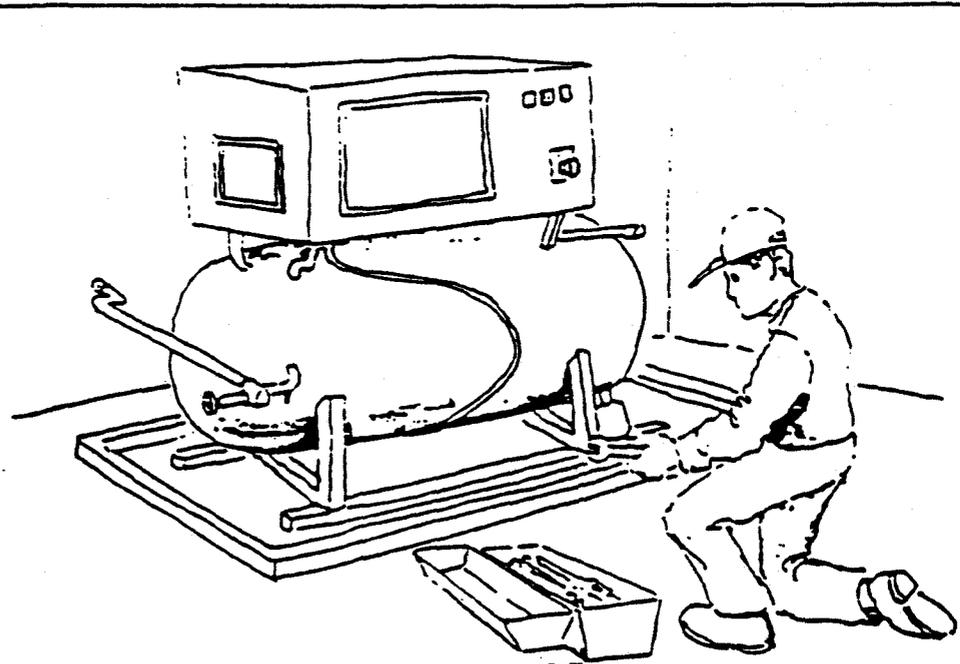
Using the equipment inventory, assign an employee to inspect each piece of equipment on a regular basis to see that it is functioning properly. This could be the employee responsible for operating the equipment if it is used regularly, or may be a maintenance staff member for equipment on the roof or in seldom-seen places. Inspect for leaks, malfunctions, and staining on and around the equipment, and other evidence of leaks and discharges. Assign the inspecting person to be responsible for reporting a spill. Develop a routine for taking actions on the report: cleaning up the spill, and repairing the leak to prevent future spills.

Where possible, take the next step toward full pollution prevention and make

modifications to prevent storm water from contacting the equipment or its discharges. Place equipment on an impermeable surface, or install a drip pan beneath potential leak points. To minimize the amount of rainwater that contacts the equipment, you may construct a simple roof and install a berm to prevent run-on and runoff. If the equipment requires a "wet" process — that is, operations inevitably releases wash water or process liquids — place it on a paved surface and install a connection to the sanitary sewer. Check with your municipality or wastewater authority to identify appropriate permits.

Air compressors and other equipment sometimes produce small quantities of automatic blowdown water, which commonly contains lubricating oil or other potential pollutants. This may not be discharged to the storm drain. Connect the blowdown to the sanitary sewer. Or, if the compressor has a frequent small bleed, place a drip pan or catchment to collect the water — do not let it soak into unpaved surfaces or run off paved surfaces.

Condensate on exterior surfaces of compressors, building cooling equipment, and other machinery need not be collected for discharge to the sanitary sewer, but may be directed to the storm drain. Prevent buildup of puddles or pools of condensate under the equipment; route it to a storm drain so it does not pick up pollutants while it flows across your site.



Keep drip pans under outdoor equipment to contain drips and leaks, especially during maintenance.

5. Outdoor Materials Storage and Handling

If you handle bulk solid materials outdoors, keep them covered, in appropriate containments, and protected from storm water. Apply this policy for raw materials, products, by-products, and construction materials or supplies. Materials of concern include gravel, sand, lumber, topsoil, compost, concrete, packing materials, metal products, and others.

Store the material in one of these ways:

- The preferred method is storage on a paved surface with a roof or covering so that no direct rainfall contacts them, and with appropriate berms or mounding to prevent run-on of storm water. Roofs are required by most municipalities for new facilities.
- Where a roof is not feasible, store on a specially constructed paved area with a drainage system. Pave the area with a slope of about 1.5% to minimize water pooling. Prevent runoff and run-on with berms or curbing along the perimeter. For many materials, the preferred alternative will be the installation of *no drain* and the testing and pumping of ponded water to the sanitary sewer, a treatment system, or offsite disposal as appropriate. Discharge to the storm drain is not allowed for many materials.
- Where a drain is allowed, install longitudinal drains that lead to treatment facilities or water quality catch basins along the lower edge of the pad. You may need a permit from your wastewater authority to discharge to the sanitary sewer, or may need the Regional Board to allow special provisions in your storm water NPDES permit (the General Permit).
- As a temporary arrangement, place the material on a paved surface and cover it with plastic sheeting, secured with weighted tires or sand bags. If possible, choose a mounded or bermed area that will prevent run-on of storm water through the material. Move the materials to a permanent storage place as soon as possible.

Parking lots or other surfaces near bulk materials storage facilities should be swept periodically to remove fines that may wash out of the materials, which will otherwise wash away with storm water. Larger bulk material storage facilities will need more

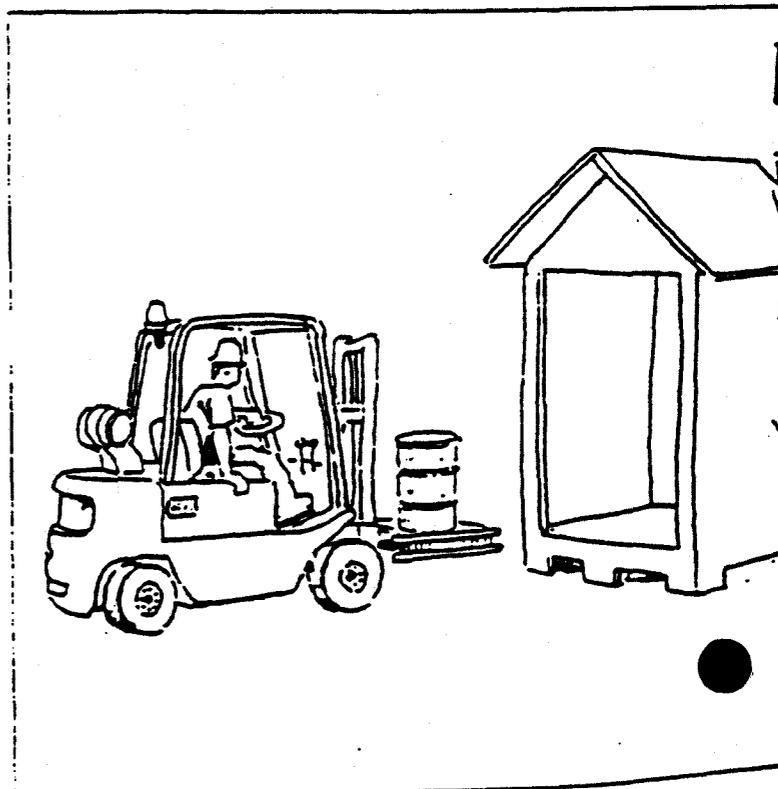
extensive structural controls designed for the specific facility and material.

Hazardous materials need to be stored in accordance with federal, state, and local HazMat requirements. The requirements are generally more than adequate to prevent storm water pollution — for instance, HazMat secondary containment may have *no drain*.

If you store liquid containers, implement a plan and a design to control unexpected leaks and spills so the liquid does not reach storm drains or surfaces that will be exposed to storm water. If you store hazardous materials, the spill prevention plans required by your HazMat authority are adequate to ensure storm water protection. Non-hazardous materials storage should also incorporate spill control designs and procedures.

Select a storage method appropriate for the type of material. Keep liquid tanks in a designated area on a paved impermeable surface and within a berm or other secondary containment. Keep outdoor storage containers especially in good condition. Inspect containers regularly for damage or leaks, as described

“Doghouse” sheds are one way to keep storm water away from barrels and materials kept outdoors, and provide spill control at the same time.



in Section 4. Clean up any leaks or spills immediately (using dry methods, described in Section 3), and repair the leaks promptly.

If the materials frequently leak during transfer, or the materials generally cause a wet environment when using or storing them, the area may need to be connected to the sanitary sewer (permitted by your wastewater authority), and should be covered and bermed to minimize contact with storm water.

Some localities *require* that secondary containments be connected to sanitary sewers, and prohibit any hard-plumbed storm drain connections within the secondary containment. On the other hand, large storage facilities and tank farms that have high-capacity bermed areas may receive rainfall over a wide area, and much of it may not contact the tanks or equipment; these might be better-served by a storm drain. As a rule, large facilities like this need site-specific storm water pollution prevention designs.

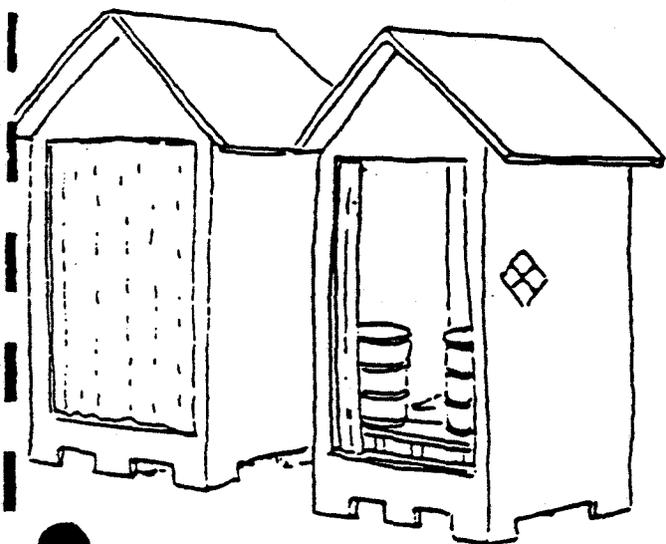
For smaller storage tanks, storage in roofed areas can prevent all contact with storm water (in combination with well-designed spill control procedures). Store liquids in a shed where one is available. New sheds, even if temporary, can be costly because of building permits and fire-code requirements. A possible option is the "doghouse" design used by some firms (illustrated). The roof and flooring prevent contact

with direct rain or run-on storm water. Since it has only two walls, most fire departments do not require sprinklers. The flooring is wire mesh above secondary containment, so most HazMat authorities accept the structure for storing hazardous materials. (A permit may be required by local building or planning departments.)

Storm water in secondary containments often accumulates from direct rainfall into open containments. Water that has contacted storage vessels, or the pumping and transfer equipment associated with storage and handling, is considered to have contacted industrial activities and may not be discharged to the storm drains.

You may wish to roof the containment to avoid this problem. If that is not possible, or you wish to avoid the cost, you need to identify an acceptable disposal for water from the containment. One common solution is a portable pumping system that can be moved to accommodate separate containment structures on your site. The equipment can pump water into a truck or portable temporary holding tank. The water then can be tested and disposed according to whether any pollutants are present. Some disposal options are:

- If it meets criteria to be defined as hazardous waste, employ a certified hazardous waste hauler for disposal at a permitted hazardous waste facility.
- If it contains constituents similar to process wastewater for which your onsite wastewater pretreatment facilities are designed, pretreat the water and discharge to the sanitary sewer.
- If it meets standards for your industrial discharge permit, discharge it to the sanitary sewer without pretreatment (if your wastewater authority permits).
- Reuse it on your site in an appropriate manner: industrial process water, equipment wash water, steam cleaning makeup, or another use where the water will eventually be discharged as industrial or sanitary wastewater. You may need to invest in a truck or plumbing to convey the water to its reuse location.
- If it is free of hazardous constituents, use it on your facility grounds for landscape watering. Don't apply the water to landscaping if hazardous pollutants are present — even if not concentrated enough to be hazardous waste — because the pollutants may accumulate in the soil or vegetation, and create a health hazard over the long term.



6. Waste Handling and Disposal

Table 2 summarizes the preferred storage and disposal practices for some common industrial facility wastes. For many wastes, reusing or recycling is the most cost-effective means to prevent potential pollution. Fluids that you hold for recycling are special categories of hazardous waste. You may store them on your site only for short periods, in accordance with hazardous waste requirements, but they can be transported under somewhat less stringent requirements than other hazardous wastes. Many recycling services have special variances or permits that reduce your paperwork requirements and allow shipping at reduced cost.

Keep general shop trash in a dumpster with the lid closed. Put the dumpster in a paved area, not on unpaved soil or your lawn. Keep the area clean by picking up dropped trash and sweeping the area regularly (perhaps once a week), but don't use a hose to clean up — keep water off the area. Nearly all dumpsters and trash compactors leak: keep liquid wastes out of them, and keep them closed to keep storm water out.

If you can't prevent leakage from trash containers, install a roof or lean-to that keeps direct rainfall off, and place asphalt curbing or berms around the dumpster to contain the leaks. (Check with your local agencies and comply with fire codes and building permits.)

If you store scrap metal or other materials outdoors, keep them under a roof, cover, or tarpaulin. Keep scrap parts or other used metals indoors. Oils and other potential pollutants can wash off long after you think the parts have been washed clean. Collect waste metal, such as used parts and metal lathe filings, for delivery to a scrap metal dealer.

If you store empty drums outdoors, do not hold them longer than necessary. Ship them to a drum reconditioner or another facility.

- Drain them completely to avoid spills.
- Seal them properly watertight, to keep storm water from entering; otherwise, the water would become a process wastewater, and can't be dumped to the storm drain.

Store and handle hazardous wastes properly. Hazardous materials or wastes are not a storm water problem if they are handled in accord with state and federal regulations, and the requirements of your local HazMat control authority.

Keep hazardous waste and materials indoors or under cover in a locked area, to keep nighttime trespassers away. Store them before disposal in special hazardous waste containers, or closed drums within a secondary containment that is approved by your HazMat authority.

Table 2. Preferred waste handling & disposal methods

		Recommended storage	Preferred disposal	Hazardous waste?
General plant wastes	Used parts: clean metal scrap	Bin (covered or indoors)	Scrap collector	No
	Used oily parts, contaminated	Drum	Hazardous waste hauler	Yes
	Metal shavings	Bin (covered or indoors)	Scrap collector	No
	Used rags	Rag bin with lid	Rag laundry	Possibly
	Soiled clean-up absorbent	Drum	Hazardous waste hauler	Yes
	Coolant from air conditioner or refrigeration equipment	Recycling machine	Reuse in-house (HVAC service company)	No
Liquid wastes	Paints*	Original container, with lid	Hazardous waste hauler	Yes
	Waste lubricating oil	Drum (segregate)	Oil recycler	Special**
	Solvents, thinners, and miscellaneous fluids*	Tank ("hot" waste) (Segregate different fluids to make recycling possible)	Solvent recycler (where possible) or waste hauler	Possibly
Liquid containers	Empty drums	Indoors or under cover	Drum reconditioner	
	Empty cans, bottles, aerosol cans, etc.	Drum	Municipal trash or hazardous waste hauler	Possibly
Vehicle wastes	Waste motor oil	Drum (segregate)	Oil recycler	Special**
	Brake fluid, gear oil, hydraulic fluids, etc.*	Bottle or tank ("hot" waste)	Hazardous waste hauler	Yes
	Antifreeze	Tank (segregate)	Recycler	Special**
	Batteries	Open rack	Battery supplier	Special**
	Tires	Covered or indoors	Tire hauler	No
	Oil filters	Drum (drain first)	Oil recycler	Special*

* Unused pure product may sometimes be returned to the vendor rather than disposed as waste. ** Recyclable under special hazardous materials restrictions.

In most cities of Santa Clara County, the municipal fire department is the HazMat authority that controls hazardous materials storage, handling, and response.

Some localities contract with the Central Fire District or County Health Department. For information about handling solid wastes that might be controlled under hazardous waste regulations, contact the County's Environmental Health Department or Cal-EPA's Toxic Substances Control Division. (See the rear cover for a list of regulatory agencies.)

Empty containers such as storage barrels, oil cans, paint buckets, aerosol cans, and similar containers are hazardous wastes if they once held hazardous materials. You may not discard these with the regular trash. They must be stored properly so they do not leak outdoors. Some drum suppliers accept empty drums for reuse, under less-stringent hazardous material recycling regulations.

Vehicle maintenance waste materials often deserve special attention. Waste oil, antifreeze, spent solvents, and some other liquids can be recycled. Spent batteries may not be discarded with trash, but must either be disposed as hazardous waste, or returned to the dealer from whom you purchased them, for reclamation and reuse. Guidance on handling vehicle wastes may be found in the Automotive Industries BMP manual, available from the NPS program and listed on the rear cover.

7. Equipment Washing and Steam Cleaning

Wash water for industrial equipment in most cases must be discharged as process wastewater to the sanitary sewer, and is not allowed in storm drains. To clean dirty, greasy field equipment or trucks you must install equipment to capture, pretreat, and discharge the wash water to the sanitary sewer as industrial process waste. It may be less costly in the long run to locate a commercial car wash which has all the appropriate equipment and municipal permits, and to contract with them for washing services offsite.

If you wash vehicles or equipment on your site, you may do so only in a designated area, designed and equipped as follows:

- Pave the area.
- Mark the area clearly as a wash area, and be sure all employees know they must wash in this area only. Post instructional signs that prohibit changing vehicle oil, washing with solvents, and other activities.
- Install sumps or drain lines to collect wash water for treatment and discharge to the sanitary sewer; reuse (for repeated washings); or recycle (used elsewhere onsite).
- If the equipment is a continuing source of grease or heavy dirt, cover the area to prevent contact with rain water when not in use.
- Grade or berm the area to prevent storm water from running on.
- If possible, wash inside a building designed for maintenance or equipment storage. Ensure that all drains connect to the sanitary sewers.

Steam cleaning should be done on your site *only* if you are equipped to capture all the water and other wastes. All the washing requirements above apply to steam cleaning as well. Steam cleaning wash water is prohibited from storm drains; requires a permit from your wastewater authority -- including pretreatment requirements, such as an oil/water separator; and may require you to determine whether it is a hazardous waste treatment unit. If you steam clean, do it indoors or in a specially-prepared outdoor working area where you collect the wash water and treat it for discharge.

8. Trucking and Shipping/Receiving

Truck loading and unloading are potential sources of pollutants when rainfall and run-on contact spilled raw materials, dust, and motor fluids that accumulate in this heavy-traffic area.

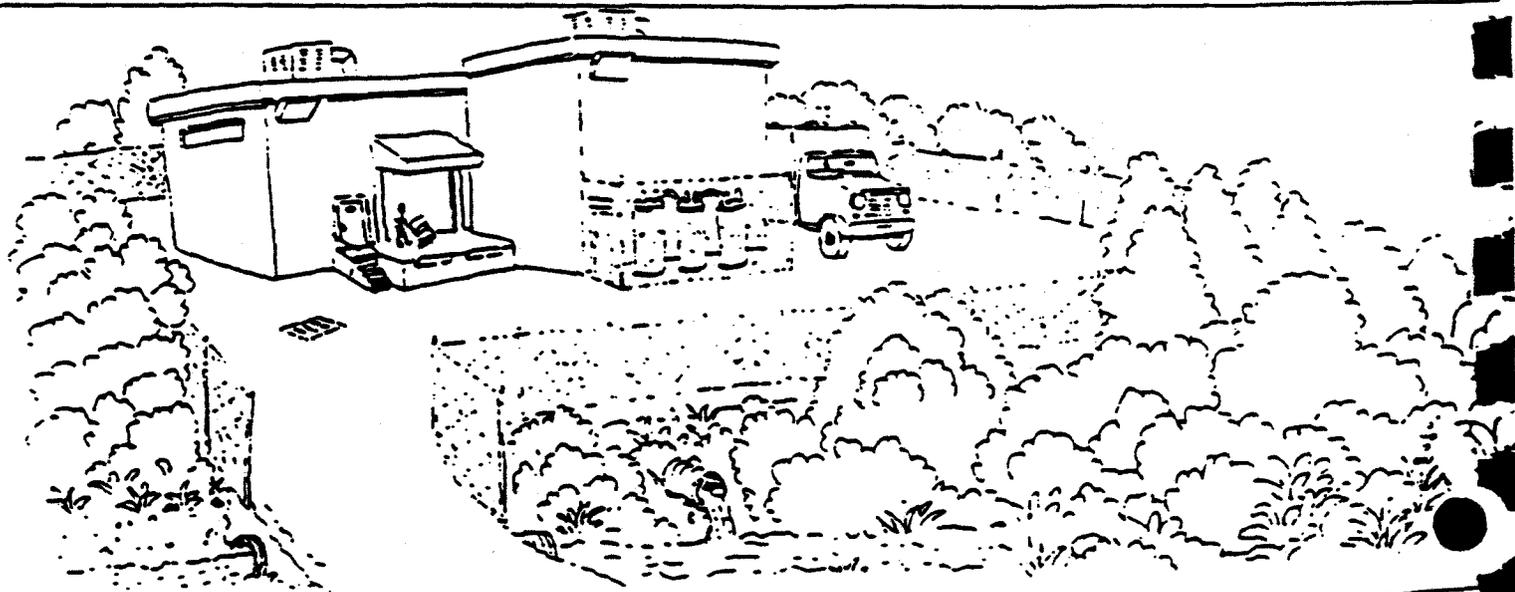
Load and unload raw materials, products, and other materials only at designated loading areas. In that way, you can isolate the potential source to areas that you can control, rather than unspecified areas throughout your site. The best areas from a storm water point of view are indoor bays. For facilities that must use an outdoor loading dock, some operational BMPs and simple design features can control storm water pollution.

- Cover the loading dock area with a roof overhang, or use a door skirt that fits snugly to both the building door and the truck door.
- Install curbs or berms around the loading area to prevent storm water from running on and any spilled material from running off. Accumulated liquids should be pumped out with a portable pump to the sanitary sewer unless concentrations exceed allowable limits. In those cases the material must be treated or shipped offsite.
- Designate the person who accepts the shipment, the truck driver, or someone else to check under the truck for leaked motor fluids, spilled materials, debris, and other foreign materials.

- If you own and operate the truck, make the driver responsible for identifying and reporting the spill — large or small.
- If you receive shipments from trucks operated by others (a trucking company or suppliers' trucks), i.e., the drivers are not your employees, have the person who signs for delivery responsible for inspecting for spills, leaks, and debris before the trucks leave.
- Detail a procedure so that a maintenance crew cleans up spilled materials promptly.
- If you have a small company that cannot spare a crew, make the driver responsible for cleaning up after unloading or before departing with a full load.
- If you identify the loading dock as a significant source of potential pollutants in your SWPP Plan, implement further control measures such as those described in Section 13.

If you load or unload liquids, you need further operational precautions and the loading dock needs further design features. If you handle hazardous materials, all the features you need are probably in place as part of a spill control and response plan. If they are not, you should select structural BMPs such as those described in Section 13.

Parking lots and access roads are sources of potential pollutants from the trucks themselves and from possible spills or leaks of the materials being transported. If you are re-grading roads and parking lots, or if you transport materials that you expect to be signifi-



Storm water runoff from industrial roofs, trucks, parking lots, and yards flows into storm drains and directly into streams and the Bay. It never receives treatment that would remove pollutants.

cant sources of potential storm water pollutants, follow structural BMPs recommended in Section 16. For existing facilities, especially smaller parking lots and short driveways where no hazardous materials are transported, you can effectively prevent storm water pollution by implementing routine maintenance activities, such as:

- Visually inspect your access roads and parking lots regularly to identify and clean up spills.
- Remove solid debris as soon as operations permit.
- Clean up liquid spills promptly, as if they were on your shop floor.

Conduct street sweeping-style cleanups periodically to remove loose debris, small amounts of spilled raw materials, road dust, and other potential pollutants.

- Smaller spaces can easily be swept by hand.
- Do not hose off paved surfaces.
- For larger spaces, use a vacuum truck or mechanical sweeper (that collects solids, not just brushes them aside). Whenever possible, do not use a wet-washing street sweeper unless you can collect the polluted wash water.
- Private corporations or your municipality might perform the work on a contract basis so you need not purchase the truck.

During the dry weather season, the appropriate frequency of sweeping for your facility depends on how heavily the road is used and the kinds of materials

you transport. Some signs that you need to sweep more frequently:

- If your trucks commonly spill or drip bulk materials.
- If you notice debris or other materials accumulating on the access roads. The correct frequency is the one that prevents unwanted materials from accumulating.

During the wet weather season, emphasize sweeping at times that will best prevent storm water from contacting potential pollutants:

- Clean the area once thoroughly in the fall, before the wet weather season begins.
- After that, you may stay close to your dry-season needs for debris removal, but add an additional thorough cleaning before a major rainfall (half an inch or more of rainfall forecast).

Dispose of the cleaned-up material with your regular facility trash if there are no hazardous materials. If you suspect it may be hazardous — if you handle hazardous materials, or if you know of a significant motor oil leak, for example — you should test the material or dispose of it with your facility's hazardous waste. You could face substantial penalties if you improperly dispose of hazardous waste.

If you park trucks or heavy equipment onsite, inspect the parking area for leaks of oil and motor fluids and design a procedure to report them, clean them up, and repair the leaking vehicle. Some practical techniques include:

- Designate consistent parking spots for each vehicle so that if a leak is indicated on the ground, the truck can be identified and repaired.
 - Designate a responsible person to check under a vehicle for leaks or spills. If you employ drivers, the driver could be responsible as part of a vehicle check before driving.
 - Clean up spills promptly, using dry cleanup procedures described in Section 3. Conduct the preferred cleanup procedures for unpaved as well as paved areas.
 - Develop a reasonable procedure for identifying, reporting, repairing, and cleaning up leaking motor fluids and spilled materials. Make sure employees are fully trained in the procedures: who is responsible for checking each truck, who should be notified, and who should respond.
-



9. Fleet Vehicle Maintenance

The Automotive BMP manual prepared by the Santa Clara Valley NPS Program addresses automotive and vehicle repair facilities. You should implement the BMPs in that manual if vehicle maintenance is a potentially significant source of pollutants on your site. Sections 9 and 10 of this manual merely summarize some of the appropriate BMPs for fleet maintenance at an industrial facility.

Whenever possible, perform vehicle maintenance in an indoor garage, not in outdoor parking areas. If you change oil and do other routine engine work outdoors, you need to create a designated area for vehicle maintenance. Keep the area clean as if it were part of your shop floor and use dry cleanup practices. The area should incorporate some specific design features, as described in Sections 14 and 15. Some operational methods also can be successful at preventing storm water pollution at vehicle maintenance areas. A few suggestions:

- Keep equipment clean: don't allow buildup of grease and oil, which will wash away when the equipment is exposed to rain.
- If you work on vehicles outdoors, keep drip pans or containers under the vehicles at all times while you work on them — leaks and spills occur unexpectedly. Place drip pans under vehicles as soon as you detect a leak.
- Drain fluids from any retired vehicles kept onsite for scrap or parts. Out-of-service vehicles you intend to restore and vehicles being held for resale should be checked periodically for leakage.
- Don't change motor oil or perform vehicle or equipment maintenance in the parking lot or storage yard; use the vehicle maintenance area. Don't allow customers or employees to change their personal vehicles' oil in your vehicle service areas.

Vehicle parking or storage yards need to be operated with some similar precautions:

- Inspect equipment in the yard for fluid leaks regularly — perhaps with a walk-by inspection for ground staining every day, and a closer visual inspection once a week.

- Keep the equipment yard clean and clear of debris, using dry sweeping methods as in Section 3. Do not hose off the area or wash with water, because any runoff becomes an illegal discharge to the storm drain.
- Maintain the yard's storm drain inlet(s) with special care. Clean them on a regular schedule and also after large storms. Pay attention to the kinds of potential pollutants that accumulate, so you can identify the sources and take measures to control the sources.

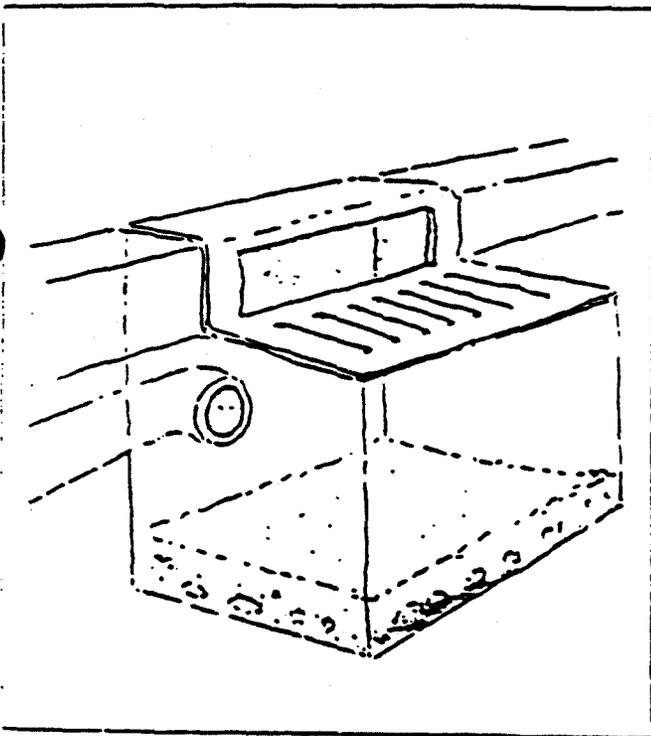
10. Fleet Vehicle and Equipment Fueling

If you have a vehicle fueling area it should be designed and operated to minimize spilled fuel and leaked fluids coming into contact with rain water. This section describes general principles, but simple operational controls may not be adequate for an industrial fueling facility. You may need to re-design your fueling area or install structural controls. Section 14 describes some general design approaches that may be useful in your eventual complete Storm Water Pollution Prevention Plan. In the near term, steps you can take for proper operation of a fueling area include:

- Use a paved area or provide a concrete slab for the fueling area — never place it on open ground. Concrete is preferred because fuel and oils cause asphalt to deteriorate.
- Clean up gasoline overflows and spills using dry methods as in Section 3. Do not allow spills to run off or evaporate, and do not flush the spill away with a hose. Spread absorbent material, sweep it up with a broom, and dispose of it as a hazardous waste.
- Post signs that instruct pump operators not to "top off" or overfill gas tanks. Keep dry cleanup materials in the fueling area, and instruct employees in the dry clean up methods described in Section 3. Assign someone responsibility to check the area every day for gasoline, motor oil, or other fluids that may have leaked.
- When you do routine cleaning, use a damp cloth on the pumps and a damp mop on the pavement rather than spraying with a hose to minimize clean water to the sump.

The main concept is to respond properly to fluid leaks in this spill-prone area. Even very small spills, when they happen every day, add up to a lot of fuel in the drainage system. This is an improper discharge that is illegal under the General Permit. Small spills do not present a problem if the fueling area is designed to handle spills — that is, if no storm water contacts it, and if it drains to a sump. But if the area drains to a valved-off storm drain or sewer connection, it must be pumped out before the valve may be opened during a rainfall.

Fuel tanks, including temporary tanks, need to be permitted by your HazMat authority. They will specify design features such as size of containments. Keep temporary fuel tanks in a bermed area that has an impervious lining, such as concrete or a heavy-gauge plastic liner.



A catch basin helps keep debris and sediments out of the storm drain, but needs to be cleaned out periodically.

11. Building Maintenance and Grounds Upkeep

Building maintenance and general outdoor cleanup should use the same principles as parking lot cleanup and spill prevention: clean up without water whenever possible, by sweeping or wiping; wash with as little water as possible; prevent and clean up spills; and clean up debris and solids so they do not reach the storm drains.

Arrange rooftop drains or downspouts so they don't drain directly onto paved surfaces. Connect them directly to a storm drain instead. Alternately, allow water to flow onto a grassy surface, if the grassy area is large enough that it can accept the roof's entire runoff from a medium-sized storm — that is, no water runs across the grassy area into a paved area except in the largest of storms.

Maintain the storm water conveyance system on your property. The "conveyance system" may be as simple as roof downspouts and a gutter in your driveway, or may be an extensive system of inlets, ditches, drainage channels, and underground lines. Keep all parts of the system clear of debris to avoid blockage that may cause storm water to back up. Remove from the system any spilled or leaked materials that can be transported by storm water.

Clean the storm drain inlets to remove sediment and debris at least twice a year — late in the dry weather season before the first storm, and after the first major storm of the wet weather season. After each large storm, inspect the inlet; remove debris; and determine whether you need to remove sediments or do other maintenance.

The storm drain inlet may have a catch basin: a below-grade chamber where the storm drain pipe connects. Catch basins are intended to collect debris and sediments to prevent clogging the lines. Therefore, the catch basins themselves must be cleaned out periodically to prevent flooding. If you clean catch basins annually, shortly before the wet weather season, you can keep them flowing freely and remove leaves, sediments, and other materials that would otherwise be washed down the storm drain. Don't flush the catch basin with water; use a shovel or vacuum device to remove the materials.

Other useful design features, such as vegetated ditches and water quality improvement inlets, are described in Sections 19, 20, and 21 as advanced BMPs.

12. Building Repair, Remodeling, and Construction

This section describes some relatively simple BMPs that apply to minor building repairs, remodeling, and minor construction projects at an industrial facility that involve "industrial activity exposed to storm water."

Larger-scale projects, such as construction of new facilities, are covered under a separate General Permit for construction. These require more extensive storm water pollution prevention measures than described here. A separate BMP manual for construction activities is available from the Santa Clara Valley NPS Program. (See rear cover.)

The same practices are *recommended* for construction activities on industrial sites. Before you begin a construction or repair project, review the Construction BMP Manual to identify and implement the appropriate practices. If those BMPs do not apply, or are unduly elaborate for a simple construction activity that will be completed in a short time, consider the BMPs described in this section.

Store building materials under cover or in contained areas, using BMPs discussed above, in Section 5. For outdoor storage at a construction site, select a pollution prevention method such as:

- Put an impermeable tarp over piles of wood, gravel, or other materials. Don't wait for forecasts of rain — do this every day, to avoid being caught unaware. Also, it will keep materials from blowing off the pile and contributing pollutants to runoff later.
- Keep the working area clean every day for the same reason. Sweep up wood splinters, paint chips, and other residues every day, as well as a thorough cleanup at the end of the project.

Painting requires some basic procedures.

- Before painting, while you scrape to remove old paint, spread a ground cloth or tarpaulin to collect dust and paint chips. If the paint contains lead or tributyl tin, dispose of the paint chips as hazardous waste.
- Mix paints indoors before starting work.
- Use impermeable ground cloths, such as plastic sheeting, while you paint. Place in-use paint

buckets in a pan or on plastic sheeting.

- At the end of the work day, store paint buckets and barrels of materials away from contact with storm water.
- Use a tarp or portable, inflatable berm to prevent spills.
- Treat a paint spill as a chemical spill: capture it before it flows to the storm drain, and clean it up promptly using dry methods.

During painting cleanup, proper procedures are:

- If you use water-based paint, clean brushes and equipment in a sink connected to the sanitary sewer.
- Clean up oil-based paint where you can collect the waste paint and solvents to be handled as small quantity hazardous waste — do not pour it to the sink or to a storm drain.
- Keep leftover paint, solvents, and other supplies for a later use, or deliver them to a solvent recycler with other plant wastes when you ship a batch.
- Handle empty paint cans and other containers as described in Section 6. Containers may be small-quantity hazardous waste. Latex paint cans are not hazardous waste if the paint is dry.

Do not fall back on old cleanup practices from days when storm water pollution was not known as a problem. Do not pour leftover paint down the storm drain or onto the ground. Do not clean brushes into the storm drain or pour buckets of cleaning water to the drain, or wash spilled paint down the storm drain with a hose. These practices are now categorized as "illegal dumping." Do not wipe brushes onto old newspapers, or pour leftover paint supplies into newspapers and discard the paper in the trash.

Spray painting requires a few extra precautions.

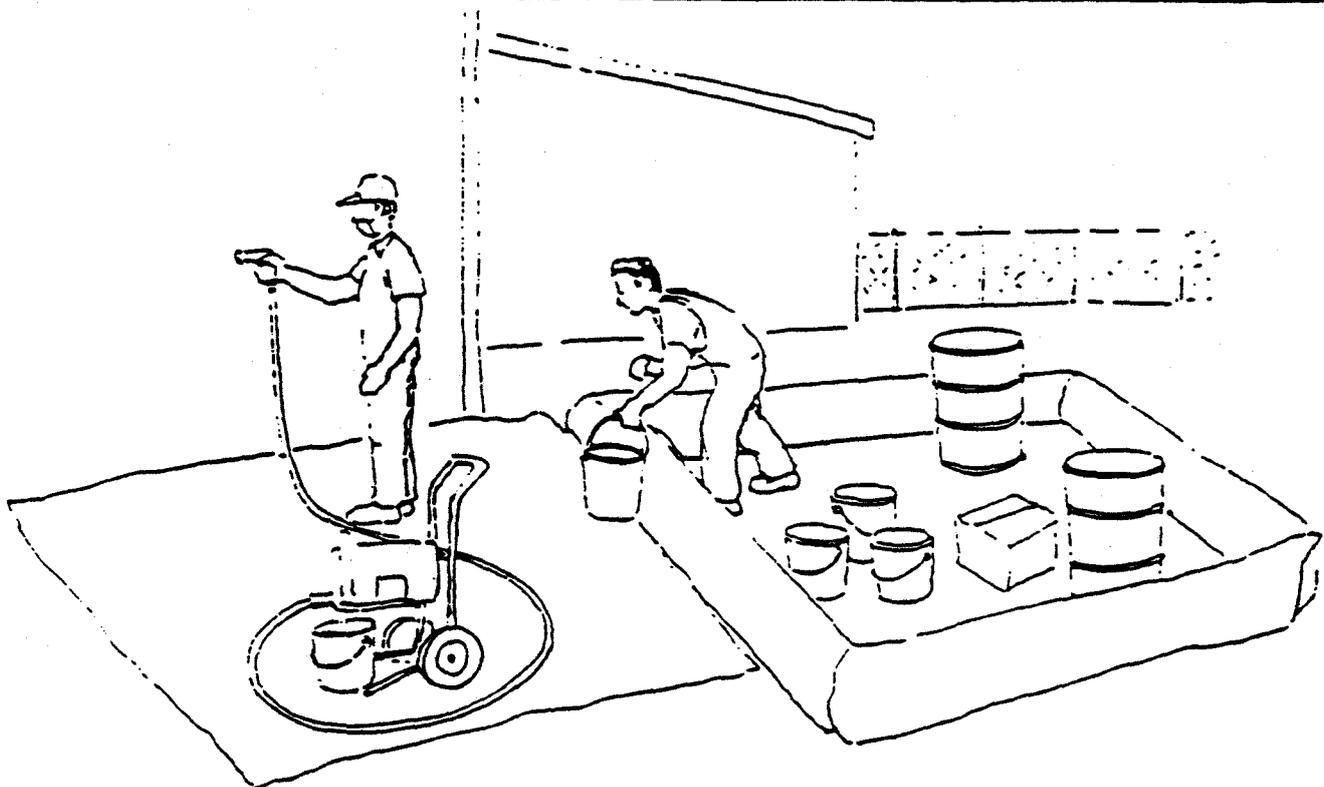
- Use temporary scaffolding to hang drop cloths or draperies to shield you from the wind and to collect overspray.
- Arrange the draperies to minimize the spreading of windblown materials.
- Be aware of air quality restrictions on spray paints that use volatile chemicals. Consider a water-based spray paint for better air quality compliance.

Sand blasting can be controlled to keep particles off paved surfaces and out of storm drains. Ask your municipality whether building and construction codes place requirements on the size and type of blasting medium that is allowed. More complete instructions are available in the Construction BMP manual for full-sized jobs, but some basics should be applied for smaller projects, as well:

- Place a tarpaulin or ground cloth beneath your work to capture the blasting medium and particles from the surface being cleaned.
- Hang tarps or drop cloths to enclose the area, using temporary scaffolding if necessary. Arrange the drop cloths to protect the work area from wind, and to capture airborne particles.
- Curtail operations on a windy day.
- Clean up frequently: collect dust and particles from the drop cloths before you produce too large a pile to handle easily.

Wood preservatives, pavement seal coating, and other outdoor surface treatments commonly contain metals, pesticides, solvents, or polymers that are hazardous materials. Handle and dispose of them properly, as follows:

- Apply only as much of the chemical as the wood can absorb or as needed to cover the paved area.
- Soak up excess chemicals with absorbent material or rags rather than allowing them to flow to the storm drains or soak into the soil.
- If the chemicals spill, clean up promptly using dry techniques: see Section 3.
- When sealing a sidewalk, prevent the sealant from reaching the gutters or drains. Use absorbent booms, or stuff rags into storm drain openings.
- When treating a roof with wood preservative or sealant, line the gutters with rags. Dispose of the rags properly: with your hazardous waste if the substances you are using are hazardous.
- If you clean a roof or sidewalk before applying preservative, sweep thoroughly to remove loose particles first, then wash with water if necessary.
- Collect wash water from downspouts or drains where possible and remove parucies.
- Avoid applying surface treatment chemicals during the wet weather season.



Outdoor painting requires practices to prevent paint and dust from becoming storm water pollutants.

Advanced BMPs and Structural Controls

Some industrial operations and plant situations require more extensive measures to control storm water pollution. All but the smallest and least complex industrial facilities are likely to require some structural modifications. Depending on your facility, and your success at eliminating potential sources of storm water pollution, your long-term implementation plan may need to include more or fewer of these advanced BMPs.

The BMPs in this section are more extensive and, in general, more costly than the recommended BMPs in Part 1. These BMPs include structural controls — storm water management measures that require constructing new facilities or installing new equipment. Not all of the advanced practices are necessary for every facility, and some will not be of use in some facilities.

You will need to evaluate your own plant to determine which BMPs are applicable to your operations, and which combination will best succeed at controlling the storm water pollutants that may run off from your site. You may find you have a choice in selecting structural BMPs, unlike in implementing basic recommended practices. Evaluate and select controls that are adequate and most cost-effective for your site.

The BMP descriptions in Part 2 are not complete design standards, but describe the central principles you need to consider in identifying and controlling storm water pollution from various sources in your plant. Design standards, performance specifications, and detailed discussion of the design and application of structural and treatment BMPs are available in a BMP manual from the state of California, scheduled for publication in late 1992.

Advanced pollution control practices take a number of forms, and may include a wide range of solutions that are not listed here. You may develop other approaches that are more effective for your facility.

Or, you may need to develop and implement further BMPs than the ones described in this manual. If you conduct more complex activities, especially activities that are unavoidably exposed to storm water, you will need to develop more intensive source control and storm water management BMPs.

If you are renovating your shop or building a new facility, you should evaluate installing some of these structural controls even if the shop does not currently have a pollution problem with that specific area. Some of the structural measures in this section are much less costly to install during new construction than to retrofit afterwards.

For example, if you re-grade an equipment parking area, you should consider storm water design criteria even if the yard has not been in violation of standards in the past. If you put off implementing the measures, future more-stringent requirements may require these same measures to be retrofitted, which can be much more costly than if you do it while constructing a new facility or renovating for other reasons.

If your principal sources of pollutants do not originate with industrial activities, you may need to control sources that are not specifically named in the General Permit, such as: pesticides and fertilizers from landscape maintenance; oil and antifreeze from autos in large employee parking lots; and cooling water or equipment lubricants from large building ventilation and cooling equipment. Your municipality and the NPS Program hold their own permit that requires they reduce pollutants in storm water from *all* sources, and they may request your cooperation in developing controls for your pollutant sources that go beyond the BMPs in this manual.

13. Loading Dock Design Features

Loading docks may require more intensive pollution controls than the operational BMPs described in Section 8. This is especially true of areas where you load or unload liquids in containers. Bulk liquid transfers are a more intensive industrial operation that requires specific control designs, and are not addressed in this manual.

Additional features of a properly-designed loading dock include:

- Grade the loading area to be sloped or recessed to direct flow toward an inlet with a shutoff valve, or toward a dead-end sump.
- Make sure the inlet includes a sump with enough capacity to hold a spill while the valve is closed.
- Keep the valve closed at all times except when you need to release storm water or other liquids that are acceptable for discharge.
- Preferably, this inlet should connect to a sanitary sewer rather than a storm drain. Check with your wastewater treatment authority for permitting requirements.

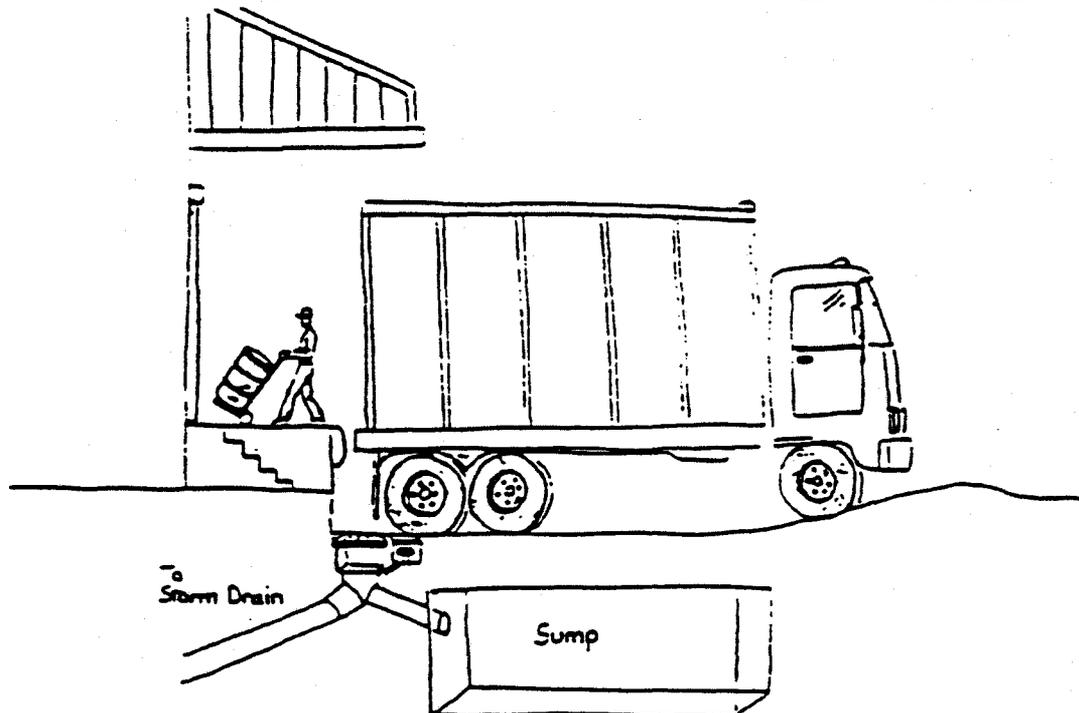
- Consider completely preventing contact with storm water using a roof and berms, as described in Section 8. This will both avoid washing potential pollutants into the drain and avoid discharging clean storm water to the sanitary sewer.

If the inlet connects to a storm drain:

- Accumulated liquid must be tested and found to contain *no pollutants* before opening the valve for discharge.
- If the liquid does contain pollutants, you need to pump it from the sump and discharge to your sanitary sewer if the wastewater treatment authority agrees to accept it. (See the recommendation below.)

If the inlet connects to a sanitary sewer:

- Accumulated liquid must be tested and found to be within the parameters specified in your wastewater discharge permit before opening the valve for discharge.
- If you cannot discharge to the sanitary sewer, you need to convey the liquid to a hazardous waste disposal facility.



A dead-end sump provides secure spill control, but any accumulated liquids need to be pumped out, tested, and properly disposed. Use berms or slopes to prevent run-on so storm water is not added to waste in the sump.

14. Equipment Yard Design Features

Parking and storage yards for large vehicles and heavy equipment generally require site-specific structural and operational controls. Follow the operational BMPs for vehicles recommended in Sections 7, 8, 9, and 10. Also assess your equipment yard to determine possible sources of pollutants, and install appropriate controls to keep potential pollutants out of the storm water. Design approaches may include:

- Grade the area to slope to a longitudinal drain, or install curbs to direct all storm water to a storm drain in the yard. If your yard is not too large and is properly designed, it should drain to a single storm drain. Even a small yard should include a storm drain on your property, and not rely on a city-operated drain in the street.
- If you determine that the equipment yard is a large source of oily materials in your storm water, consider fitting the inlet(s) with a sand filter (see Section 20) or removing oily pollutants (see Section 21).

Segregate the area where you service vehicles, and install special structural controls.

- If possible, perform all work indoors, or construct a roof over the specified area. This will require a building permit and compliance with appropriate fire codes.
- Pave the surface with concrete, not asphalt. Vehicle fluids may dissolve asphalt, or may be absorbed into the blacktop and released later.
- Drain the surface to a single drain, preferably connected to a sanitary sewer. The drain may require an oil/water separator or oil/grease trap, and must be approved by your wastewater treatment authority.
- Grade the working area to be higher than the parking lot, or surround it with a berm, to prevent storm water run-on.
- Construct a special area in which to segregate your "dirtiest" equipment (roof tar equipment, asphalt paving equipment, etc.) Handle its discharges, leaks, and runoff separately. This approach could save you from the need to treat all the runoff from the equipment yard.

15. Fleet or Equipment Fueling Area Design Features

If your facility's vehicle fueling area is one of the significant sources you identify in your SWPP Plan, you may need more intensive BMPs than the operational efforts described in Section 10. Some design features to consider are:

- Cover the fueling area to prevent rain from falling directly on the area. Install a roof over the fueling island, the area where vehicles park while fueling, and as much of the approach area as practical. Leaked engine fluids and spilled fuel inevitably accumulate on the pavement in these heavily-trafficked areas.
- Storm drain and sewer inlets that drain the fueling area must be equipped with a shutoff valve to keep fuel out of the drain in the event of a spill from the pumps. The valve should be kept closed at all times except during a rainfall.
- Curtail fueling activities when the valve must be open, or use extra precautions to capture any spilled fuel, such as a large drip pan under the vehicle.

A number of different approaches may serve as effective drainage design. The fueling area needs to be separated from the rest of the yard, both to contain any fuel spill and to prevent storm water from running on. Select or adapt a scheme such as one of these:

- Grade the fueling area to be "mounded" or elevated. The Automotive Industries BMP manual includes a suggested mounded grading scheme.
- Install berms around the area that are high enough to redirect water from a large storm.
- Grade the entire fueling area to drain to a single inlet. You can accomplish this with longitudinal drains at the perimeter along the "downhill" side of the fueling area, or with a depression in the middle of the fueling area. Either way, be sure to design the grading to avoid run-on.
- At the inlet, either install a sump, from which you will pump any accumulated liquids; or connect to a sanitary sewer, after checking to get all the permits the wastewater authority may require. The sump or connection should be operated as suggested for a loading dock area in Section 13.

16. Access Roads and Rail Corridors

Access roads and rail corridors can be significant sources of pollutants for some industrial facilities. In the General Permit, access roads and rail corridors are defined as "industrial activities exposed to storm water" that you must include in identifying potential sources and selecting BMPs for your SWPP Plan.

Maintenance and operational BMPs for access roads are the same as those described for vehicle access and parking areas under Section 9. Some structural BMPs are described below.

Proper drainage design is a good place to start. Generally, this means the roads should be crowned and sloped outward; and that storm water should not be allowed to drain across the road, but be carried in ditches or culverts alongside the road. Grass-lining the roadside ditches can be an effective way to remove storm water pollutants — see Section 20. Maintain the ditch to be sure it does not clog or fill with sediments, allowing storm water to overflow. Plant vegetation by the roadside to control erosion and to promote groundwater infiltration.

If your site includes railroad access, an important source of pollutants is the preservatives on wooden railroad ties. Use a less-toxic preservative; avoid organic toxics such as creosote and pentachlorophenol. Or use concrete ties or other non-wooden ties.

Control spills and dust from railroad unloading. If your rail line delivers or picks up liquids, in bulk or in containers, you may need to add spill-control loading docks with shutoff valves. (See Section 3 for spill controls, and Section 13 for loading dock design features). If parked railroad cars drip, install a drip pan at the loading dock between the rails.

17. Onsite Storm Water Management

Some industrial facilities may still find potential pollutants exposed to storm water even after implementing source control measures like the operational BMPs in the first part of the manual and the structural source controls above. Further structural controls can be used to manage the storm water itself, either to control the flow of the runoff (described in Section 19), to remove some of the pollutants in passive devices (Section 20), or to remove pollutants using specially-designed equipment (Section 21).

The best way to avoid the need for storm water management or treatment is to use source controls, most likely in combination. The right combination for your facility will probably include conscientious implementation of BMPs such as those recommended in Sections 1 through 12 of this manual, attention to the sources of waste at your facility, and careful reduction of process wastes.

If you need to manage storm water onsite, the most important consideration is to minimize the quantity of storm water that contacts potential pollutants. For example, keep the area of industrial activities as small as possible; separate the area from parking lots, to prevent run-on; and roof or enclose the area if possible.

Design your storm water conveyance system to isolate the areas where storm water contacts potential pollutants, and convey water from those areas separately from water that runs off of "clean" and non-industrial parts of the site. This will allow you to control storm water with smaller and less-costly hydraulic or water quality controls. Or, if you plan to discharge to your wastewater treatment authority (Section 18), reducing the volume will reduce the discharge cost and increase the willingness of your wastewater authority to accept the discharge.

18. Redirect Storm Water Discharge from Storm Drain to Sanitary Sewer

If source control BMPs are not adequate to prevent discharging pollutants in storm water from your facility, you may need to cease discharging storm water that contacts those pollutants. One way to avoid discharging potential pollutants with storm water is to isolate runoff from that part of your facility where the pollutants are contacted and discharge the storm water to the sanitary sewer rather than a storm drain.

Installing new connections and new piping can be quite costly, and the required permits may be a barrier, so this could be a costly BMP. Also, it will require a permit from your local wastewater authority. The permit will specify the volume of water you may discharge, the kind of pretreatment equipment you may need to install and operate, and requirements for monitoring your discharge.

Redirecting discharge to the sanitary sewer may not be allowable in all localities — some wastewater authorities have sections in their local ordinances that prohibit the discharge of storm water to the sanitary sewer. Requirements might differ from one municipality to another, so contact the authority that serves your area for information. (See the list on the rear cover.)

Your wastewater treatment authority, as a rule, would prefer to minimize the volume of storm water that passes through the treatment system. You should reduce the quantity of storm water you redirect, using techniques like those described in Section 17.

The wastewater authority may require temporary storage of your storm water onsite, to avoid overloading their facilities during a storm. Your authority is more likely to accept discharge of storm water that has contacted pollutants if you can store it temporarily and deliver it *after* the high flows from a storm event.

19. Storm Water Management: Hydraulic Controls

Hydraulic controls are intended to control *quantity* of storm water discharge, but can be useful for water *quality* as well by removing potential pollutants from storm water. BMPs of this type are widely used to control erosion of hillsides and to remove sediments from storm water runoff. Also, hydraulic-control BMPs can help to remove oils and heavy metals that adsorb to sediment particles in storm water.

Design standards and operating information for hydraulic controls are available in a number of references. The NPS Program is preparing a manual of "new development" BMPs recommended for newly-constructed buildings, which includes discussion of hydraulic BMPs for storm water pollution control and conditions under which hydraulic BMPs should be implemented. Design specifications for hydraulic controls will also be addressed in detail in a BMP manual being prepared by the state of California for storm water pollution control. Many local and regional regulations that target erosion control give specifications for hydraulic BMPs.

Hydraulic controls are designed for one of two purposes. One category serves to control the rate of peak flow, slowing the flow of water at the height of the storm to reduce its potential to carry away soils and other contaminants. The other type reduces volume of runoff, generally by causing some storm water to *infiltrate* (or soak into the soil) rather than running off into storm drains, streets, or streams. Some approaches control both peak rate and volume.

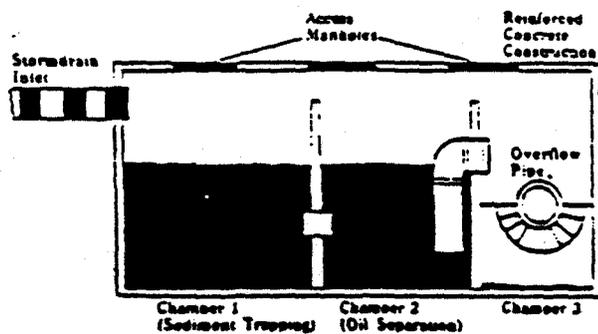
Hydraulic controls for a site are most effective if the overall site design is considered. The first step generally is to modify the site layout to increase the water-permeable surface, to increase infiltration and reduce runoff volume. If greater flow control is needed, the second step may be to strategically place *infiltration trenches* to intercept runoff and promote infiltration. (Infiltration may not be permitted in some areas — see Section 20.) For large quantities of flow, onsite ponds can be designed either to slow the peak flow of storm water or to hold water onsite until it infiltrates or evaporates. These are known as *detention ponds* or *retention ponds*. A variation is the *storm water wetland*, which similarly controls flow while wetland vegetation helps remove pollutants.

20. Storm Water Management: Water Quality Controls

A number of specific storm water management controls are better suited to water quality control than hydraulic control. These features may be added to various parts of the storm water conveyance system on an industrial site to help control potential pollutants in the storm water before it leaves the site. They are for the most part passive design features rather than treatment devices in the usual sense. Information in existing references gives design parameters for these water quality controls, so this section merely summarizes a few types of controls.

A simple technique is a vegetated swale or channel, a ditch that carries storm water in which plants are permitted to grow. The plants provide some peak flow control by slowing the water. They also remove some pollutants by encouraging the deposition of sediments and minor oily wastes. This control can be retrofitted to some existing storm water conveyance ditches simply by allowing grasses to grow, if it does not interfere with storm water drainage and cause water to back up to the site.

WATER QUALITY INLET

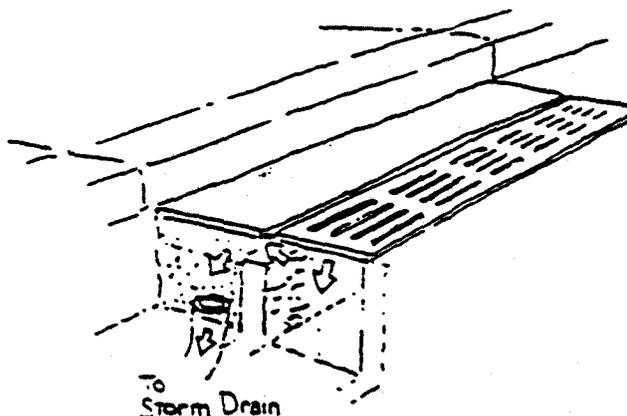


Depth of Pool - 4 Feet
Permanent Pool - 400 Cubic Feet per Acre

An API separator is only partly effective at removing oily wastes, but is more effective at removing sediments than an ordinary catch basin.

A water quality inlet is a simple multi-purpose device, shown in the diagram above. A storm drain inlet is fitted with an enlarged catch basin or grit chamber where solids and sediments settle out of the water. A baffle restricts the flow of surface-floating oil, which can be removed by hand later. Floatable debris also collects at the baffle. This type of inlet has in the past

been used to help remove oily wastes, but is of limited effectiveness. Section 21 describes the inlet further, including its maintenance requirements.



A sand filter inlet can remove some pollutants before they enter the storm drain.

A sand filter inlet is a storm drain inlet that contains sand or another filter medium. The sand removes particulates and oily wastes from storm water as it enters the storm drain. An extension of the same concept is a sand filter, where storm water quality can be improved before discharge. Sand filters appear to be particularly effective if used in combination with detention or retention ponds, by diverting the first-flush of runoff (often carrying the most pollutants) to the filter and routing the remainder of the water to the pond.

Many of these water quality controls can be designed either of two ways: to control potential pollutants before discharging water to a storm drain; or to remove unwanted constituents and then direct the storm water into the ground as an *infiltration* device. Any of these controls that use infiltration techniques, or others designed specifically to promote infiltration, (porous pavement, infiltration trenches, and others), may be restricted or prohibited in some municipalities as potential sources of ground water contamination. Dry wells for disposal of storm water are illegal under State and Federal Law. The Regional Board's newly-amended Basin Plan for the San Francisco Bay Region adopts some new policies that address infiltration devices. The NPS Program does not recommend them in areas where shallow ground water may be impacted. Check with your municipality before installing an infiltration device.

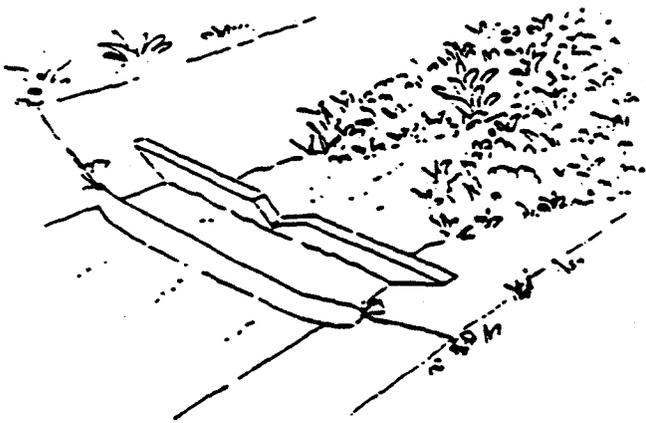
1. Storm Water Management: Removing Oily Pollutants

A simple technique to remove oils and grease from storm water uses oil-absorbent materials (or *oleophilic* materials), such as the booms used to contain oil spills. The absorbent material preferentially absorbs oil, and does not fill with water, so it can be used on storm water with small concentrations of oily materials.

Some facilities that have a storm water conveyance ditch where water flows season-long have found it convenient to install a permanent floating boom to control an occasional light surface sheen. When the boom is spent, it is full of oil and is visibly heavier, floating lower in the water. The booms are inexpensive enough that they may easily be replaced whenever the absorbent is saturated. Disposal is more costly, since they may be hazardous waste unless an oil recycler can accept the material.

Oil/water separators are a broad category of devices that are intended to remove oily constituents. There are many varieties of oil/water separators, and the term is not used in the same way by all equipment vendors or design specifications.

For most applications, oil/water separators are *not recommended* as a storm water management strategy. Source control BMPs are strongly preferred. Oil/water separators are fairly costly, and most



Oil-absorbent booms can remove oily sheen from storm water. Vegetation in an open ditch can slow the flow, helping sediments settle.

designs do not operate best at the low concentrations commonly present in storm water. A sand filter inlet is typically more effective, and less costly, for the small quantities and low concentrations of oils in routine storm water runoff — that is, runoff that has not directly contacted oily industrial activities.

Separators may be useful in limited applications. They are sometimes useful as a retrofit measure, to temporarily help a facility comply while it installs more effective source control BMPs. Another use is in spill control sumps, upstream of a treatment process. The advanced designs are sometimes used as a treatment device (that will discharge to a sanitary sewer) for storm water that contacts industrial activities in isolated areas where contact cannot be avoided.

The API oil/water separator is a simple design, named for the American Petroleum Institute. The API separator is sometimes called an "oil and grease trap," to distinguish it from a true oil/water separator used for industrial wastewater. An API separator usually is a long basin with multiple chambers or vaults, typically installed below grade. It can be fitted to storm drains or storm water inlets in a variety of configurations — the water quality inlet described in Section 20 is one form. The intent is to slow water and stratify the flow so that oil rises. The floating oil is then retained by one or more baffles in the chambers.

An API separator removes the bulk of floating oily wastes, especially if the oil is not well-mixed but floats on top of the water. However, it is not highly efficient, so storm water can still be polluted unacceptably even after it flows through the inlet. The separator works by concentrating oily wastes within the chamber, so inevitably some of the collected wastes are carried away during heavier storms. It can be made somewhat more effective at oil removal if it includes pads or pillows of oleophilic material at the water surface level.

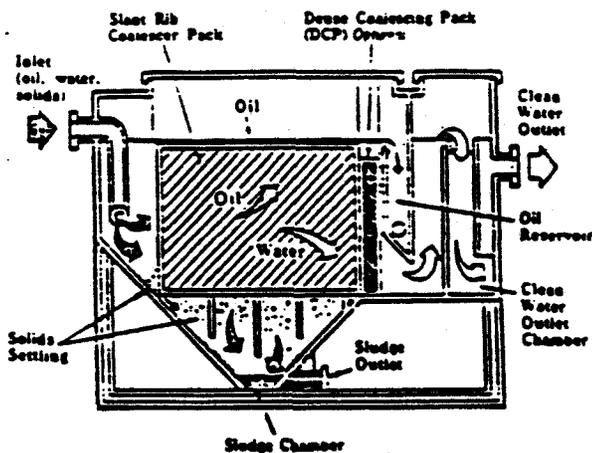
If you install an API separator, it *must be maintained* regularly. It requires a standing pool of water, which should be pumped out periodically and replaced with clean water. To clean, remove oil floating on the standing pool and greasy matter collected at the baffle. Some commercial oil recyclers accept this material for recycling; otherwise, it must be handled as hazardous waste. If you install oil-absorbent pillows, the pillows must be closely monitored and replaced when they are saturated, also disposed either as hazardous waste or to a recycler. If the inlet includes a sediment trap, as in the water quality inlet shown in Section 20, remove solids with a shovel between storms.

WATERWORKS

Develop a regular cleaning schedule appropriate for your facility. For inlets that don't carry much flow, three cleanings per year are sufficient: once before the rainy season (mid-September) to remove materials that have accumulated; once after the first major storm; and once at the end of the rainy season to prevent slow loss or evaporation of the collected oily wastes. If storm water flow is greater, the API separator may need to be cleaned monthly, or periodically between storms. As another guideline, clean the separator before three inches of oil accumulate in the entry chamber.

The CPI, or coalescing plate interceptor oil/water separator, is a more advanced design. These are common for treatment of oil-bearing industrial wastewater, but are less often cost-effective for storm water. The CPI separator generally achieves greater removal efficiency than an API type, but is more costly to purchase and operate. A CPI separator can attain a high removal efficiency, and accommodate a fairly high flow rate, but at ever-increasing capital costs for the equipment (by adding more separator plates). The best economics generally apply for relatively high concentrations of oil at low and constant flow rates.

SLANT RIB COALESCING SEPARATOR



A CPI separator can be very effective at removing oil but requires upstream sediment control and can be costly to maintain.

A few design features can improve the effectiveness of an oil-water separator. Pollution removal effectiveness is highest if the concentration is high when the storm water enters the unit. Avoid diluting the water to be treated with water from other parts of the site, where it does not contact the potential pollutants, both to save

on the capital investment and to increase treatment effectiveness. For industrial process applications, an evaporator can be used reduce the volume of water treated.

An oil-water separator works best if sediment is not present in the water — limit your water to be treated to isolated areas, free of mud and soils if possible. Efficiency is highest with a fairly steady flow, so you may require upstream detention. Also, don't site the separator downstream of a pump, because the pump mixes the oil and water and partially emulsifies the oil, so separators are less effective.

Storm water treatment generally is *not recommended* as a BMP. Some of the devices described in Section 21 may be considered to be treatment by the state or by your local wastewater treatment authority, which can open the door to some burdensome regulatory restrictions and permitting requirements.

For most industrial facilities, the best advice about onsite storm water treatment is to avoid it, for a number of reasons. Most of the available treatment equipment is costly to purchase and to receive permitting approval for. Operational costs can also be significant — you must monitor the equipment to assure continued effectiveness, and may need to prepare and submit chemical analyses to demonstrate continued compliance.

Further, in most places in the Santa Clara Valley, treatment of storm water means you must discharge it to the sanitary sewer rather than the storm drain (as described in Section 17). In effect, water on which you perform treatment is no longer considered to be storm water, but industrial wastewater instead. You will need to obtain or modify a discharge permit from your local wastewater authority or your municipality.

The most troublesome permitting procedures are for hazardous materials. Before installing any treatment equipment, determine whether your waste water is a hazardous waste. Cal-EPA/Toxics or the County Environmental Health Department can describe the necessary testing and approval procedures. If the wastewater that would enter the pretreatment equipment is considered to be hazardous you must obtain a permit from Cal-EPA/Toxics to operate a hazardous waste treatment facility. At present this may be true even for a simple water quality inlet. If you determine that the waste stream is not hazardous, and do not apply for a hazardous waste treatment permit, keep your testing documentation on hand to show regulators.

At Your Construction Site

Whether you're building a home, office or large scale development, construction creates special problems for Estuary water quality. Once the bulldozer's cleared your property of rocks and vegetation, not to mention reshaped the landscape, there may be little left to protect the soil from severe erosion and few barriers to stop site runoff. While the primary pollutant is sediment, construction can also contribute pollution from the miscellaneous chemicals and fuels lying around the work site. And poor construction quality, both in buildings and sanitary systems, can mean more pollution in the years to come.

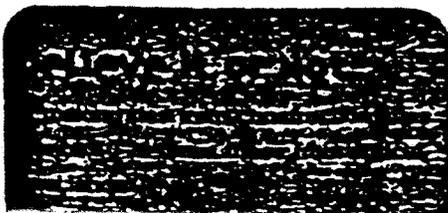


☛ **Avoid bulldozing** and outdoor construction in the rainy season.

☛ **Schedule construction** to minimize soil exposure.

☛ **Limit soil disturbance,** keeping as much of the original vegetation as possible, and planting temporary cover as necessary.

☛ **Check your soil type** and build accordingly. Get a soil survey, and share it with your engineer, architect and builder. Make sure to survey all pertinent factors, including permeability, the level of the water table, the soil's texture, and the steepness of slopes.



Construction the clean way . . .

☛ **Pick your building site** carefully. Avoid level areas at the base of hills (which tend to be wet); streambanks, soggy spots, and depressions.

☛ **Locate septic systems** at a sufficient distance from streams, lakes, drainage ditches, flood plains, wetlands and the Estuary shore in accordance with government regulations.

☛ **Divert runoff around** excavations using check dams and ditches, and filter structures made out of stone, gravel or sandbags.

☛ **Install gravel trenches** along driveways or patios to collect water and allow it to filter into the soil.

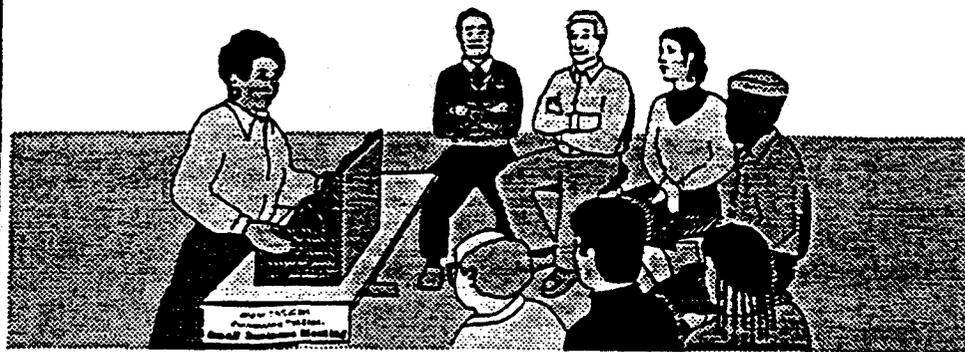
☛ **Keep sites clean** of loose dirt, litter, toxic chemicals and other debris.

☛ **Conduct all vehicle** and equipment maintenance and refueling at one location with pollution prevention controls. Perform major repairs off-site at appropriate facilities.

☛ **Cover stockpiles** and landscaping materials with tarps.

☛ **Look up the law.** Federal law now requires construction sites over five acres in size to apply for a stormwater discharge permit and develop a stormwater management plan.

ACTIVITY: EMPLOYEE TRAINING



Applications

Manufacturing

Material Handling

Vehicle Maintenance

Construction

Commercial Activities

Roadways

Waste Containment

Housekeeping Practices

DESCRIPTION

Employee training, like equipment maintenance, is not so much a best management practice as it is a method by which to implement BMPs. This fact sheet highlights the importance of training and of integrating the elements of employee training from the individual source controls into a comprehensive training program as part of a facility's Storm Water Pollution Prevention Plan (SWPPP).

The specific employee training aspects of each of the source controls are highlighted in the individual fact sheets. The focus of this fact sheet is more general, and includes the overall objectives and approach for assuring employee training in storm water pollution prevention. Accordingly, the organization of this fact sheet differs somewhat from the other fact sheets in this chapter.

OBJECTIVES

Employee training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute storm water;
- Identify solutions (BMPs);
- Promote employee ownership of the problems and the solutions; and
- Integrate employee feedback into training and BMP implementation.

APPROACH

- Integrate training regarding storm water quality management with existing training programs that may be required for your business by other regulations such as: the Illness and Injury Prevention Program (IIPP) (SB 198) (California Code of Regulations Title 8, Section 3203), the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard (29 CFR 1910.120), the Spill Prevention Control and Countermeasure (SPCC) Plan (40 CFR 112), and the Hazardous Materials Management Plan (Business Plan) (California Health and Safety Code, Section 6.95).
- Businesses, particularly smaller ones that are not regulated by Federal, State, or local regulations, may use the information in this Handbook to develop a training program to reduce their potential to pollute storm water.

LISTING OF INDUSTRIAL ACTIVITIES

Employee training is a vital component of many of the individual source control BMPs included in this chapter. Following is a compilation of the training aspects of the source control fact sheets.

SC14



ACTIVITY — EMPLOYEE TRAINING (Continue)

SC1 Non-Storm Water Discharges to Drains

- Use the quick reference on disposal alternatives (Table 4.1) to train employees in proper and consistent methods for disposal.
- Consider posting the quick reference table near storm drains to reinforce training.

SC2 Vehicle and Equipment Fueling

- Train employees in proper fueling and cleanup procedures.
- The SPCC Plan may be an effective program to reduce the number of accidental spills from fueling.

SC3 Vehicle and Equipment Washing and Steam Cleaning

- Train employees in standard operating procedures and spill cleanup techniques described in the fact sheet.

SC4 Vehicle and Equipment Maintenance and Repair

- Train employees in standard operating procedures and spill cleanup techniques described in the fact sheet.
- Paint stencils to remind employees not to pour waste down storm drains.

SC5 Outdoor Loading/Unloading of Materials

- Use a written operations plan that describes procedures for loading and/or unloading.
- Have an emergency spill cleanup plan readily available.
- Employees trained in spill containment and cleanup should be present during loading/unloading.
- Make sure fork lift operators are also properly trained.

SC6 Outdoor Container Storage of Liquids

- Registered and specifically trained professional engineers can identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.
- Employees trained in emergency spill cleanup procedures should be present when dangerous waste, liquid chemicals, or other wastes are handled.

SC7 Outdoor Process Equipment Operations and Maintenance

- The preferred and possibly most economical action to reduce storm water pollution is to alter the activity. This may mean training employees to perform the activity during dry periods only or substituting benign materials for more toxic ones.

SC8 Outdoor Storage of Raw Materials, Products, and By-Products

- Train employees in standard operating procedures and spill cleanup techniques described in the fact sheet.

SC9 Waste Handling and Disposal

- Train employees in standard operating procedures and spill cleanup techniques described in the fact sheet.
- Paint stencils to remind employees not to pour waste down storm drains.

SC10 Contaminated or Erodible Surface Areas

- Training is not a significant element of this best management practice.

SC14



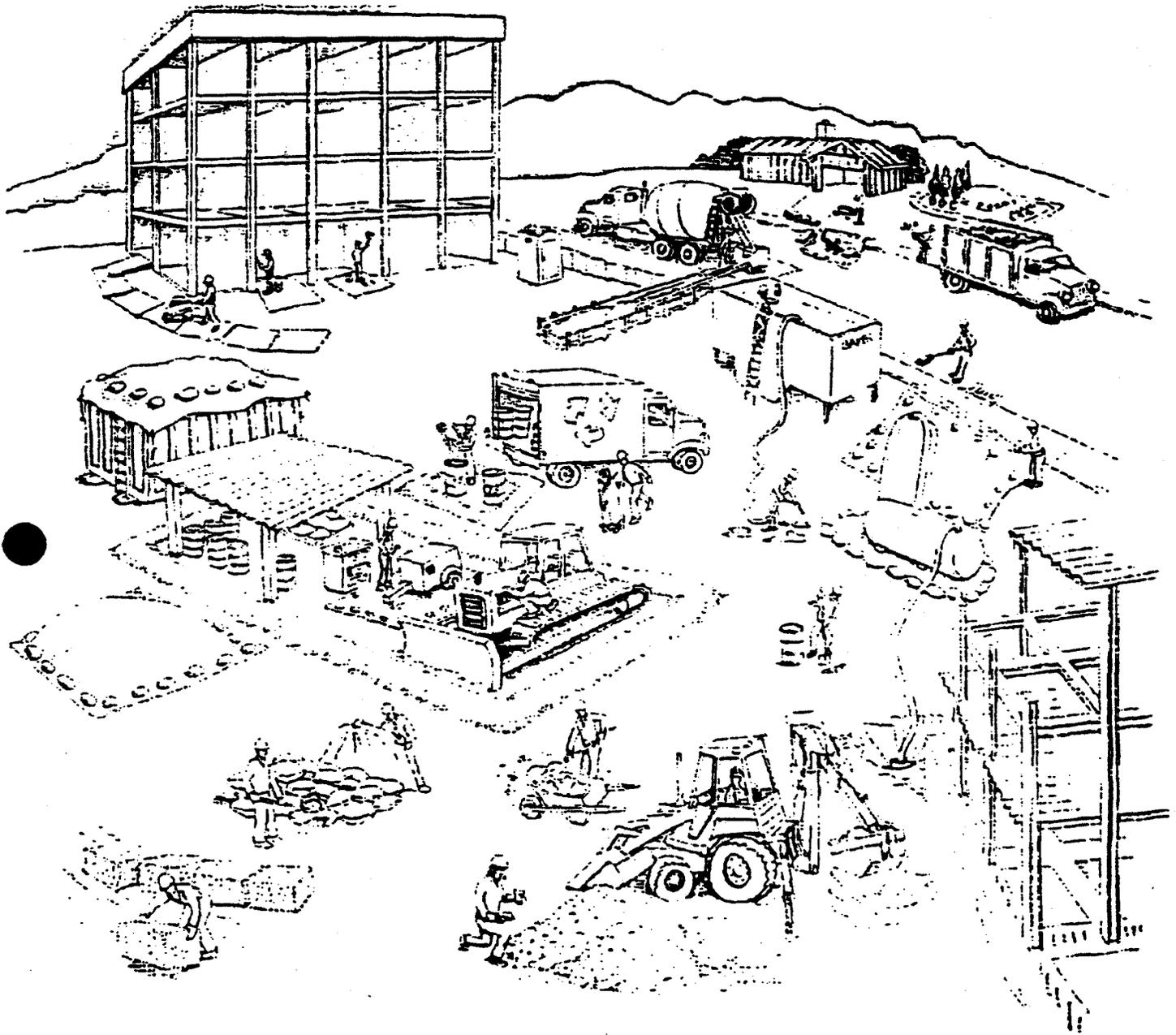
F

F. CONSTRUCTION RELATED

Blueprint for a clean ocean
Employee/Subcontractor Training (CA40)

Blueprint for a Clean Ocean

● Best Management Practices to Prevent Stormwater Pollution from Construction-Related Activities



This booklet has been developed as a resource for all general contractors, home builders, and subcontractors working on construction sites.

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Introduction

Stormwater pollution is rapidly growing in importance as a national environmental issue. In California, stormwater pollution is a major source of water pollution. To help combat the problems of stormwater pollution, federal and state governments have developed a program for monitoring and permitting discharges to municipal storm drain systems, creeks, and water bodies such as the Pacific Ocean.

Municipalities in the Los Angeles Area are required by the Clean Water Act to develop stormwater management programs that include requirements for construction activities. Your construction project will need to comply with local municipal requirements. If your construction activity will disturb five acres or more, you must also obtain coverage under the General Construction Activity Permit (see Requirements for Dischargers).

Blueprint for a Clean Ocean is an introductory guide to stormwater quality control on construction sites. It contains several principles and techniques that you can use to help prevent stormwater pollution. This booklet has been developed as a resource for all general contractors, home builders, and subcontractors working on construction sites.

Blueprint for a Clean Ocean is not a design manual or a Stormwater Pollution Prevention Plan (SWPPP) (see Requirements for Dischargers). For more information on the General Permit, designing stormwater quality controls, or producing a Stormwater Pollution Prevention Plan, please refer to the California Storm Water Best Management Practice Handbook for Construction Activity, or consult your local program or the SWRCB (see below). Please note that this booklet is concerned only with the management of construction sites and activities during construction.

Stormwater Pollution

Storm Drain System

Stormwater or runoff from sources like sprinklers and hoses flows over the ground into the storm drain system. In the Los Angeles Area, storm drain systems consist of gutters, storm drains, underground pipes, open channels, culverts, and creeks. Storm drain systems are designed to drain directly to the Pacific Ocean with no treatment.

Pollution From Construction Sites

Stormwater runoff is part of a natural hydrologic process. However, land development and construction activities can significantly alter natural drainage patterns and pollute stormwater runoff. Runoff picks up pollutants as it flows over the ground or paved areas and carries these pollutants into the storm drain system. Common sources of pollutants from construction sites include: sediments from soil erosion; construction materials and waste (e.g., paint, solvents, concrete, drywall); landscaping runoff containing fertilizers and pesticides; and spilled oil, fuel, and other fluids from construction vehicles and heavy equipment.

Adverse Effects from Stormwater Pollution

Stormwater pollution is a major source of water pollution in California. It can cause declines in fisheries, disrupt habitats, and limit water recreation activities. Even more importantly, stormwater pollution poses a serious threat to the overall health of the ecosystem.

For more information on stormwater requirements, call the State Water Resources Control Board's Stormwater Information Line at (916) 657-1146 or your local program.

Requirements for Dischargers

Municipal Stormwater Program

Municipalities in the Los Angeles Area are required by federal regulations to develop programs to control the discharge of pollutants to the storm drain system, including the discharge of pollutants from construction sites and areas of new development or significant redevelopment. As a result, your development and construction projects may be subject to new requirements designed to improve stormwater quality such as, expanded plan check and review, new contract specifications, and increased site inspection. For more information on municipal requirements, please contact the municipal representative listed on the back cover of this booklet.

Projects Equal To Or Greater Than 5 Acres

If your construction activity will disturb five acres or more, you must obtain coverage under the General Construction Activity Storm Water Permit (General Construction Permit) issued by the State Water Resources Control Board (SWRCB) for stormwater discharges associated with construction activity. To obtain coverage under the General Permit, a Notice of Intent (NOI) must be filed with the SWRCB. The General Construction Permit requires you to prepare and carry out a "Stormwater Pollution Prevention Plan" or SWPPP. Your SWPPP must identify appropriate stormwater pollution prevention measures or best management practices (BMPs), like the ones described in this booklet, to reduce pollutants in stormwater discharges from the construction site both during and after construction is completed. A best management practice or BMP is defined as any program, technology, process, practice, operating method, measure, or device which controls, prevents, removes, or reduces pollution.

Projects Less Than 5 Acres

If your project is less than five acres, you may still need to use BMPs to comply with local municipal requirements. Check with the local planning or engineering department for details.

For more information on the General Permits, call the State Water Resources Control Board's Stormwater Information Line at (916) 657-1146 or your local program.

Best Management Practices

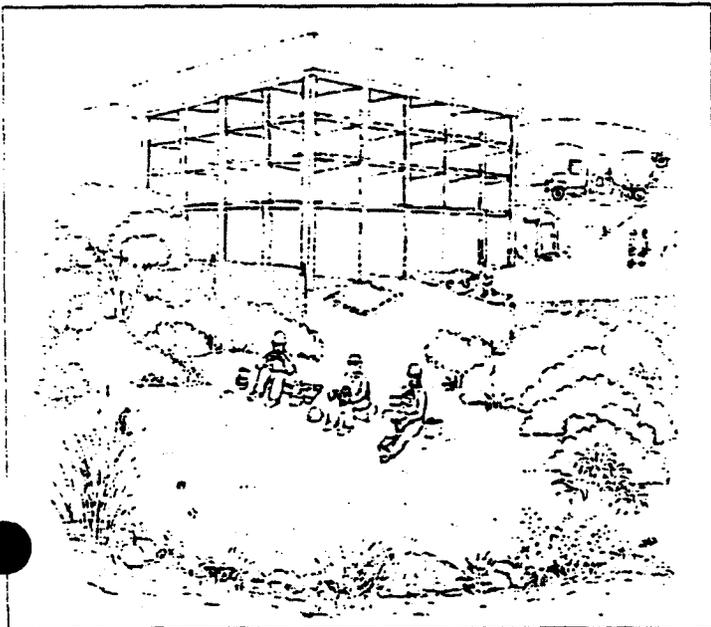
General Practices

The following are some general principles that can significantly reduce pollution from construction activity and help make compliance with stormwater regulations easy:

- ❑ Identify all storm drains, drainage swales and creeks located near the construction site and make sure all subcontractors are aware of their locations to prevent pollutants from entering them.
- ❑ Clean up leaks, drips, and other spills immediately so they do not contact stormwater.
- ❑ Refuel vehicles and heavy equipment in one designated location on the site and take care to clean up spills immediately.
- ❑ Wash vehicles at an appropriate off-site facility. If equipment must be washed on-site, do not use soaps, solvents, degreasers, or steam cleaning equipment, and prevent wash water from entering the storm drain. If possible, direct wash water to a low point where it can evaporate and/or infiltrate.
- ❑ Never wash down pavement or surfaces where materials have spilled. Use dry cleanup methods whenever possible.
- ❑ Avoid contaminating clean runoff from areas adjacent to your site by using berms and/or temporary or permanent drainage ditches to divert water flow around the site. Reduce stormwater runoff velocities by constructing temporary check dams and/or berms where appropriate.
- ❑ Protect all storm drain inlets using filter fabric cloth or other best management practices to prevent sediments from entering the storm drainage system during construction activities.
- ❑ Keep materials out of the rain — prevent runoff pollution at the source. Schedule clearing or heavy earth moving activities for periods of dry weather. Cover exposed piles of soil, construction materials and wastes with plastic sheeting or temporary roofs. Before it rains, sweep and remove materials from surfaces that drain to storm drains, creeks, or channels.

Best Management Practices

- Keep pollutants off exposed surfaces. Place trash cans around the site to reduce litter. Dispose of non-hazardous construction wastes in covered dumpsters or recycling receptacles.
 - Practice source reduction — reduce waste by ordering only the amount you need to finish the job.
 - Do not over-apply pesticides or fertilizers and follow manufacturers instructions for mixing and applying materials.
 - Recycle leftover materials whenever possible. Materials such as concrete, asphalt, scrap metal, solvents, degreasers, cleared vegetation, paper, rock, and vehicle maintenance materials such as used oil, antifreeze, batteries, and tires are recyclable.
 - Dispose of all wastes properly. Materials that cannot be reused or recycled must be taken to an appropriate landfill or disposed of as hazardous waste. Never throw debris into channels, creeks or into wetland areas. Never store or leave debris in the street or near a creek where it may contact runoff.
- Illegal dumping is a violation subject to a fine and/or time in jail. Be sure that trailers carrying your materials are covered during transit. If not, the hauler may be cited and fined.
- Train your employees and inform subcontractors about the stormwater requirements and their own responsibilities.



Specific Practices

Following is a summary of specific best management practices for erosion and sediment control and contractor activities. For more information on erosion and sediment control BMPs and their design, please refer to the California Storm Water Best Management Practice Handbook for Construction Activity (March 1993).

Erosion Prevention and Sediment Control

Prevent erosion

Soil erosion is the process by which soil particles are removed from the land surface, by wind, water and/or gravity. Soil particles removed by stormwater runoff are pollutants that when deposited in local creeks, lakes, and the Pacific Ocean, can have negative impacts on aquatic habitat. Exposed soil after clearing, grading, or excavation is easily eroded by wind or water. The following practices will help prevent erosion from occurring on the construction site:

- Plan the development to fit the topography, soils, drainage pattern and natural vegetation of the site.
- Delineate clearing limits, easements, setbacks, sensitive or critical areas, trees, drainage courses, and buffer zones to prevent excessive or unnecessary disturbances and exposure.
- Phase grading operations to reduce disturbed areas and time of exposure.
- Avoid excavation and grading during wet weather.
- Limit on-site construction routes and stabilize construction entrance(s).
- Remove existing vegetation only when absolutely necessary.
- Construct diversion dikes and drainage swales to channel runoff around the site.
- Use berms and drainage ditches to divert runoff around exposed areas. Place diversion ditches across the top of cut slopes.

Best Management Practices

- ☐ Plant vegetation on exposed slopes. Where replanting is not feasible, use erosion control blankets (e.g., jute or straw matting, glass fiber or excelsior matting, mulch netting).
- ☐ Consider slope terracing with cross drains to increase soil stability.
- ☐ Cover stockpiled soil and landscaping materials with secured plastic sheeting and divert runoff around them.
- ☐ As a back-up measure, protect drainage courses, creeks, or catch basins with straw bales, silt fences and/or temporary drainage swales.
- ☐ Once grading is completed, stabilize the disturbed areas using permanent vegetation as soon as possible.
- ☐ Conduct routine inspections of erosion control measures especially before and immediately after rainstorms, and repair if necessary.
- ☐ Collect and detain sediment-laden runoff in sediment traps (an excavated or bermed area or constructed device) to allow sediments to settle out prior to discharge.
- ☐ Use sediment controls and filtration to remove sediments from water generated by dewatering.
- ☐ Prevent construction vehicle tires from tracking soil onto adjacent streets by constructing a temporary stone pad with a filter fabric underliner near the site exit where dirt and mud can be removed.
- ☐ When cleaning sediments from streets, driveways and paved areas on construction sites, use dry sweeping methods where possible. If water must be used to flush pavement, collect runoff to settle out sediments and protect storm drain inlets.

Note: Performance of erosion and sediment controls is dependent on proper installation, routine inspections and maintenance of the controls. Most of the BMPs described above are temporary and if left alone can quickly fall into disrepair and/or become ineffective. Routine inspections and maintenance, particularly before and after a storm event, must be part of any erosion and sediment control plan.

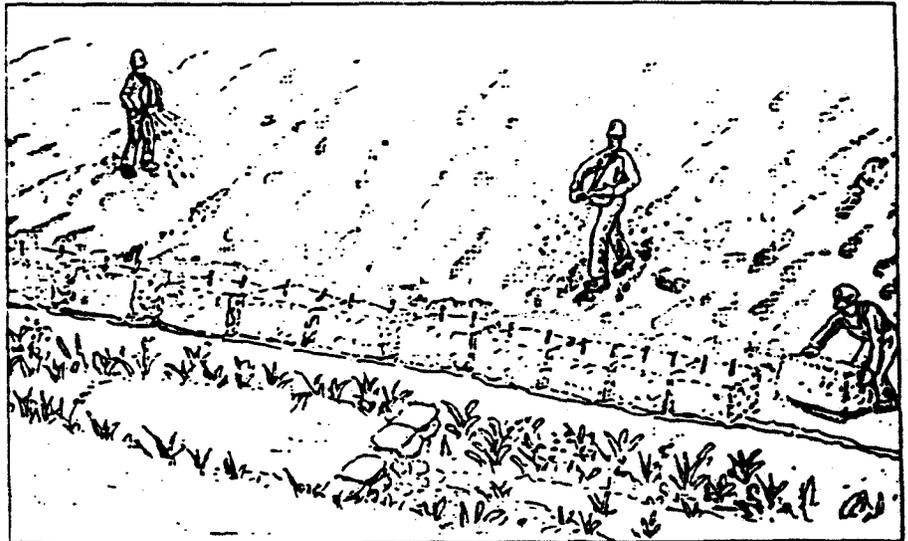
Control sediment

Sedimentation is defined as the process of depositing sediments picked up by runoff. Sediments consist of soil particles, clays, sands, and other minerals.

The purpose of sediment control practices is to remove sediments from stormwater before they are transported off-site or reach a storm drain inlet or nearby creek. The most effective sediment control practices reduce runoff velocity and trap or detain runoff allowing sediments to settle out.

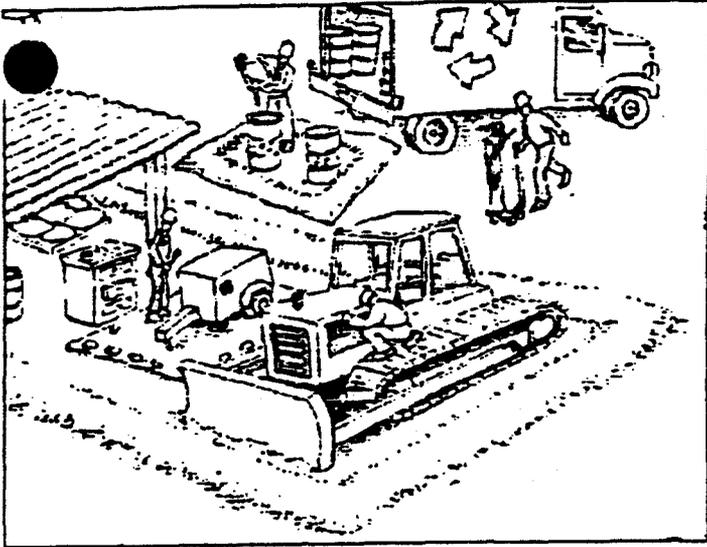
- ☐ Use terracing, rip rap, sand bags, rocks, straw bales, and/or temporary vegetation on slopes to reduce runoff velocity and trap sediments. Do not use asphalt rubble or other demolition debris for this purpose.
- ☐ Use check dams in temporary drains and swales to reduce runoff velocity and promote sedimentation.
- ☐ Protect storm drain inlets from sediment-laden runoff. Storm drain inlet protection devices include sand bag barriers, filter fabric fences, block and gravel filters, and excavated drop inlet sediment traps.

The California Storm Water Best Management Practices Handbook for Construction Activity provides specific details and design criteria for erosion and sediment control plans.



Drainage swales channel runoff around a construction site. Planting temporary vegetation on freshly graded areas, and trenching and staking straw bales and/or silt fences downslope are common techniques for preventing erosion and controlling sediment.

Best Management Practices



Make sure equipment repair area is bermed or well away from creeks and storm drains.

General Site Maintenance

Prevent spills and leaks

Poorly maintained vehicles and heavy equipment leaking fuel, oil, antifreeze, or other fluids on the construction site are common sources of stormwater pollution and soil contamination. Construction material spills can also cause serious problems. Careful site planning, preventive maintenance, and good materials handling practices can eliminate most spills and leaks.

- Maintain all vehicles and heavy equipment. Inspect frequently for and repair leaks.
- Designate specific areas of the construction site, well away from creeks or storm drain inlets, for auto and equipment parking and routine vehicle and equipment maintenance.
- Perform major maintenance, repair jobs and vehicle and equipment washing off-site when feasible, or in designated and controlled areas on-site.

- If you must drain and replace motor oil, radiator coolant, or other fluids on-site, use drip pans or drop cloths to catch drips and spills. Collect all spent fluids, store in labeled separate containers, and recycle whenever possible. Note that in order to be recyclable, such liquids must not be mixed with other fluids. Non-recycled fluids generally must be disposed of as hazardous wastes.

Clean up spills immediately after they happen

When vehicle fluids or materials such as paints or solvents are spilled, cleanup should be immediate, automatic, and routine.

- Sweep up spilled dry materials (e.g., cement, mortar, or fertilizer) immediately. Never attempt to "wash them away" with water, or bury them. Use only minimal water for dust control.
- Clean up liquid spills on paved or impermeable surfaces using "dry" cleanup methods (e.g., absorbent materials like cat litter, sand or rags).
- Clean up spills on dirt areas by digging up and properly disposing of the contaminated soil.
- Report significant spills to the appropriate spill response agencies immediately (See reference list on the back cover of this booklet for more information).



Clean up spills on dirt areas by removing contaminated soil.

Note: Used cleanup rags that have absorbed hazardous materials must either be sent to a certified industrial laundry or dry cleaner, or disposed of through a licensed hazardous waste disposal company.

Best Management Practices

Store materials under cover

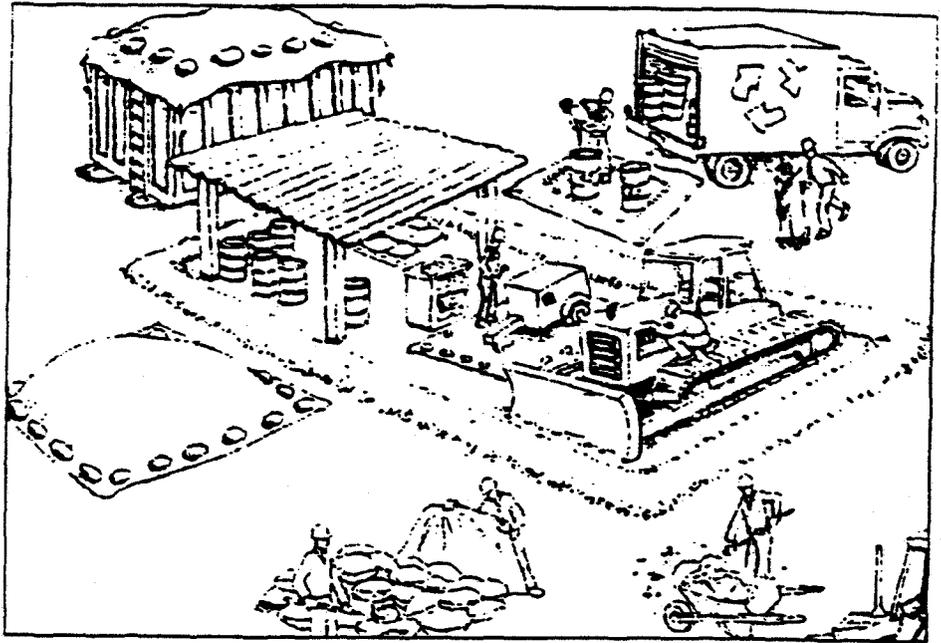
and dry building materials with the potential to pollute runoff should be stored under cover and/or surrounded by berms when rain is forecast or during wet weather.

- ❑ Store stockpiled materials and wastes under a temporary roof or secured plastic sheeting or tarp.
- ❑ Berm around storage areas to prevent contact with runoff.
- ❑ Plaster or other powders can create large quantities of suspended solids in runoff, which may be toxic to aquatic life and cause serious environmental harm even if the materials are inert. Store all such potentially polluting dry materials—especially open bags—under a temporary roof or inside a building, or cover securely with an impermeable tarp. By storing dry materials under a roof, you may also help protect air quality, as well as water quality.
- ❑ Store containers of paints, chemicals, solvents, and other hazardous materials in accordance with secondary containment regulations and under cover during rainy periods.

Cover and maintain dumpsters

Open or leaking dumpsters can be a source of stormwater pollution.

- ❑ Cover open dumpsters with plastic sheeting or a tarp during rainy weather. Secure the sheeting or tarp around the outside of the dumpster. If your dumpster has a cover, close it.
- ❑ If a dumpster is leaking, contain and collect leaking material. Return the dumpster to the leasing company for repair/exchange.
- ❑ Do not clean dumpsters on-site. Return to leasing company for periodic cleaning, if necessary.



Store building materials under cover. Make sure dumpsters are properly covered to keep out rain.

Collect and properly dispose of paint removal wastes

Paint removal wastes include chemical paint stripping residues, paint chips and dust, sand blasting material and wash water. These wastes contain chemicals that are harmful to the wildlife in our creeks and the water bodies they flow to. Keep all paint wastes away from the gutter, street, and storm drains.

- ❑ Non-hazardous paint chips and dust from dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash. Chemical paint stripping residue and chips and dust from marine paints or paints containing lead or tributyl tin must be disposed of as a hazardous waste.
- ❑ When stripping or cleaning building exteriors with high-pressure water, cover or berm storm drain inlets. If possible (and allowed by your local wastewater treatment plant), collect (mop or vacuum) building cleaning water and discharge to the sanitary sewer. Alternatively, discharge non-contaminated wash water onto a dirt area and spade into the soil. Be sure to shovel or sweep up any debris that remains in the gutter and dispose of as garbage.

Best Management Practices

Clean up paints, solvents, adhesives, and other cleaning solutions properly

Although many paint materials can and should be recycled, liquid residues from paints, thinners, solvents, glues, and cleaning fluids are hazardous wastes. When they are thoroughly dry, empty paint cans, used brushes, rags, absorbent materials, and drop cloths are no longer hazardous and may be disposed of as garbage.

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or creek.
- ❑ For water-based paints, paint out brushes to the extent possible and rinse to a drain leading to the sanitary sewer (i.e., indoor plumbing).
- ❑ For oil-based paints, paint out brushes to the extent possible, and filter and reuse thinners and solvents. Dispose of unusable thinners and residue as hazardous waste.
- ❑ Recycle, return to supplier or donate unwanted water-based (latex) paint. You may be able to recycle clean empty dry paint cans as metal.
- ❑ Dried latex paint may be disposed of in the garbage.
- ❑ Unwanted paint (that is not recycled), thinners, and sludges must be disposed of as hazardous waste.
- ❑ More and more paint companies are recycling excess latex paint (See separate list of "Recyclers and Disposal Services" for more information).

Keep fresh concrete and cement mortars out of gutters, storm drains, and creeks

Concrete and cement-related mortars that wash into gutters and storm drains are toxic to fish and the aquatic environment.

- ❑ Avoid mixing excess amounts of fresh concrete or cement mortar on-site.
- ❑ Store dry and wet materials under cover, protected from rainfall and runoff.
- ❑ Wash out concrete transit mixers only in designated wash-out areas where the water will flow into settling ponds or onto dirt or stockpiles of aggregate base or sand. Pump water from settling ponds to the sanitary sewer, where allowed. Whenever

possible, recycle washout by pumping back into mixers for reuse. Never dispose of washout into the street, storm drains, drainage ditches, or creeks.

- ❑ Whenever possible, return contents of mixer barrel to the yard for recycling. Dispose of small amounts of excess concrete, grout, and mortar in the trash.

Service and maintain portable toilets

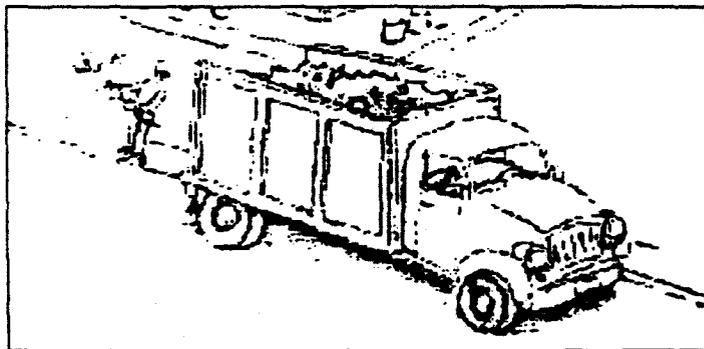
Leaking portable toilets are a potential health and environmental hazard.

- ❑ Inspect portable toilets for leaks.
- ❑ Be sure the leasing company adequately maintains, promptly repairs, and replaces units as needed.
- ❑ The leasing company must have a permit to dispose of waste to the sanitary sewer.

Dispose of cleared vegetation properly

Cleared vegetation, tree trimmings, and other plant material can cause environmental damage if it gets into creeks. Such "organic" material requires large quantities of oxygen to decompose, which reduces the oxygen available to fishes and other aquatic life.

- ❑ Do not dispose of plant material in a creek or drainage facility or leave it in a roadway where it can clog storm drain inlets.
- ❑ Avoid disposal of plant material in trash dumpsters or mixing it with other wastes. Compost plant material or take it to a landfill or other facility that composts yard waste.



Recycle yard waste and tree prunings at a landfill that chips and composts plant material.

Demolition Waste Management

Make sure all demolition waste is properly used of

Demolition debris that is left in the street or pushed over a bank into a creek bed or drainage facility causes serious problems for flood control, storm drain maintenance, and the health of our environment. Different types of materials have different disposal requirements or recycling options.

- Materials that can be recycled from demolition projects include: metal framing, wood, concrete, asphalt, and plate glass.
- Materials that can be salvaged for reuse from old structures include: doors, banisters, floorboards, windows, 2x4s, and other old, dense lumber.
- Unusable, unrecycleable debris should be confined to dumpsters, covered at night and during wet weather, and taken to a landfill for disposal.
- Hazardous debris such as asbestos must be handled in accordance with specific laws and regulations and disposed of as a hazardous waste. For more information of asbestos handling and disposal regulations, contact the South Coast Air Quality Management District.
- Arrange for an adequate debris disposal schedule to insure that dumpsters do not overflow.

Roadwork and Pavement Construction

Plan roadwork and pavement construction to avoid stormwater pollution

Road paving, surfacing, and asphalt removal happen right in the street, with numerous opportunities for stormwater pollution from the asphalt mix, saw-cut slurry, or excavated material. Properly proportioned asphalt mix and well-compacted pavement avoid a host of water pollution problems.

- Apply concrete, asphalt, and seal coat during dry weather to prevent contaminants from contacting stormwater runoff.
- Cover storm drain inlets and manholes when paving or applying seal coat, slurry seal, fog seal, etc.
- Always park paving machines over drip pans or absorbent materials, since they tend to drip continuously.
- When making saw-cuts in pavement, use as little water as possible. Cover each catch basin completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sand bags, or gravel dams around the catch basin. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.
- Wash down exposed aggregate concrete only when the wash water can: (1) flow onto a dirt area; (2) drain onto a bermed surface from which it can be pumped and disposed of properly; or (3) be vacuumed from a catchment created by blocking a storm drain inlet. If necessary, place straw bales down-slope, or divert runoff with temporary berms. Make sure runoff does not reach gutters or storm drains.
- Allow aggregate rinse to settle, and pump the water to the sanitary sewer if allowed by your local wastewater authority.
- Never wash sweepings from exposed aggregate concrete into a street or storm drain. Collect and return to aggregate base stockpile, or dispose with trash.
- Recycle broken concrete and asphalt.

Contaminated Poned Stormwater, Groundwater, and Soil Guidance

Look for ponded stormwater, groundwater, and/or soil contamination

Poned stormwater, groundwater and soil may become contaminated if exposed to hazardous materials. If any of the following conditions apply, contaminated ponded stormwater, groundwater, and/or soil may be present and pose a potential health and environmental hazard:

- The project site is in an area of previous commercial/industrial activity;
- There is a history of illegal dumping on the site or adjacent properties;
- The construction site is subject to a Superfund, state, or local cleanup order;
- Ponded stormwater, groundwater and/or water generated by dewatering exhibits an oily-sheen and/or smells of petroleum;
- Soil appears discolored, smells of petroleum and/or exhibits other unusual properties;

- Abandoned underground storage tanks, drums, or other buried debris are encountered during construction activities; or
- Spills have occurred on the site or adjacent properties involving pesticides and herbicides; fertilizers; detergents; plaster and other products; petroleum products such as fuel, oil, and grease; or other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Take appropriate action

Poned stormwater, groundwater, or water generated by dewatering that is contaminated cannot be discharged to a street, gutter, or storm drain. If contamination is suspected, the water should be contained and held for testing. Call the appropriate local agency and/or the Regional Water Quality Control Board for further guidance (See reference list on the back cover of this booklet for more information).

Remember: The property owner and the contractor share ultimate responsibility for the activities that occur on a construction site. You may be held responsible for any environmental damage caused by your subcontractors or employees.

Pollution Control Agencies and Sources of Information

Storm water quality management program

County of Los Angeles
(800) 303-0003

City of Los Angeles
(800) 974-9794

Agencies to call for local construction site requirements

In county unincorporated areas
and in the cities of:

Artesia
Bellflower
Bradbury
Carson
Cerritos
Commerce
Duarte
Industry
Irwindale
La Cañada/Flintridge
Lawndale
Mirada
La Puente
Lawndale
Lomita
Rolling Hills
Santa Fe Springs
Temple City
Westlake Village

(818) 458-3187

Agencies to call in the event of a spill

You are required by law to report
all significant releases or
suspected significant releases of
hazardous materials, including oil.

To report a spill, call the following
agencies:

1. Dial (800) 303-0003 or your
local emergency response number.
2. Call the Governor's Office of
Emergency Services Warning
Center, (800) 852-7550 (24 hours).

For spills of "Federal Reportable
Quantities" of oil, chemicals, or
other hazardous materials to land,
air, or water, notify the National
Response Center (800-424-8802).
If you are not sure whether the
spill is of a "reportable quantity,"
call the federal Environmental
Protection Agency (800) 424-9346
for clarification.

For further information, see
*California Hazardous Material
Spill/ Release Notification Guidance*
(State Office of Emergency
Services, Hazardous Materials
Division).

Agencies to call if you find or suspect contaminated soil or groundwater

Regional Water Quality
Control Board:
Los Angeles Basin
(213) 266-7500

California Environmental
Protection Agency (Cal EPA),
Department of Toxic Substances
Control (DTSC) (510) 540-3732

Documents and available resources

From State Water Resources
Control Board (SWRCB)
(916) 657-1146:

*General Construction Activity
Storm Water Permit*

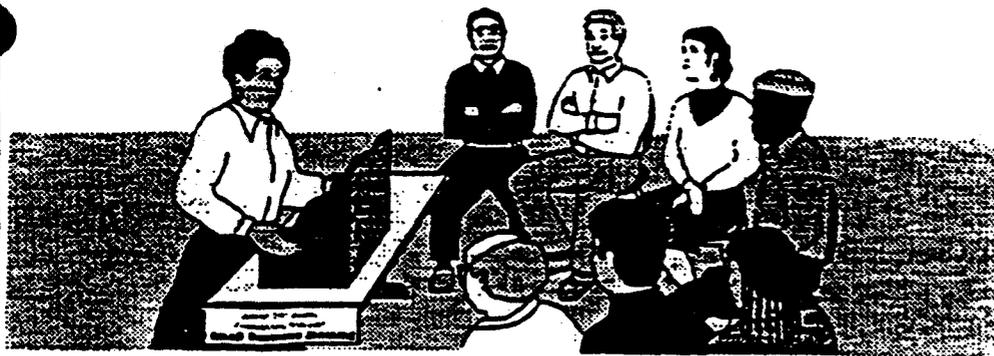
*California Storm Water Best
Management Practice Handbook -
Construction Activity*

From Cal EPA, DTSC
(916) 322-3670:

*Waste Minimization for the
Building Construction Industry -
Fact Sheet*

Los Angeles County gratefully acknowledges the Santa Clara Valley NonPoint Source Pollution Control Program and BASMAA for the concept, content, and artwork for this booklet.

ACTIVITY: EMPLOYEE/SUBCONTRACTOR TRAINING



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Employee/subcontractor training, like maintenance or a piece of equipment, is not so much a best management practice as it is a method by which to implement BMPs. This fact sheet highlights the importance of training and of integrating the elements of employee/subcontractor training from the individual source controls into a comprehensive training program as part of a company's Storm Water Pollution Prevention Plan (SWPPP).

The specific employee/subcontractor training aspects of each of the source controls are highlighted in the individual fact sheets. The focus of this fact sheet is more general, and includes the overall objectives and approach for assuring employee/subcontractor training in storm water pollution prevention.

OBJECTIVES

Employee/subcontractor training will be based on four objectives:

Promote a clear identification and understanding of the problem, including activities with the potential to pollute storm water; Identify solutions (BMPs);

Promote employee/subcontractor ownership of the problems and the solutions; and

Integrate employee/subcontractor feedback into training and BMP implementation.

APPROACH

Integrate training regarding storm water quality management with existing training programs that may be required for your business by other regulations such as: the Illness and Injury Prevention Program (IIPP) (SB 198) (California Code of Regulations Title 8, Section 3203), the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard (29 CFR 1910.120), the Spill Prevention Control and Countermeasure (SPCC) Plan (40 CFR 112), and the Hazardous Materials Management Plan (Business Plan) (California Health and Safety Code, Section 6.95).

Use the quick reference on disposal alternatives (Table 4.2) to train employee/subcontractors in proper and consistent methods for disposal.

CA40



ACTIVITY: EMPLOYEE/SUBCONTRACTOR TRAINING (Continue)

Consider posting the quick reference table around the job site or in the on-site office trailer to reinforce training. Train employee/subcontractors in standard operating procedures and spill cleanup techniques described in the fact sheets and in the SWPPP. Employee/subcontractors trained in spill containment and cleanup should be present during the loading/unloading and handling of materials.

Personnel who use pesticides will be trained in their use. The California Department of Pesticide Regulation and county agricultural commissioners licensed pesticide dealers, certify pesticide applicators, and conduct on-site inspections.

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employee/subcontractors, can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do on-site.

Ensure that workers who are non-English speakers or for whom English is a second language either receive training and materials in their native language or ensure that those persons adequately comprehend materials and training given in English.

CA40



G. LANDSCAPE RELATED BMPs

Storm Drains are for Rain – Not Pesticides

Storm Drains are for Rain – Not Fertilizer

Preventing Pollution Through Efficient Water Use

Management Guidelines for use of Fertilizers and Pesticides

Twenty Ways to Protect Your Water

Healthy Lawn Healthy Environment

Citizen's Guide to Pest Control & Pesticide Safety

Model Water Efficient Landscape Ordinance

United States
Environmental Protection
Agency

20W-0002
July 1990

OW (WH-556)

OPPE (PM-222)



Preventing Pollution Through Efficient Water Use



**How Efficient Water Use
Helps Prevent Pollution**



**Other Reasons to Use
Water Wisely**



**What Individuals
Can Do**



**What Communities
Can Do**



How Efficient Water Use Helps Prevent Pollution

Using water more efficiently can help prevent pollution as well as protect and conserve our finite water resources. More efficient water use by you and your community has many other benefits.

Fewer Pollutants

- ☛ Using less water reduces the amount of wastewater discharged into our lakes, streams, rivers, and marine waters.
- ☛ The amount of pollutants wastewater carries can also be reduced, as treatment efficiency improves.
- ☛ Recycled process water can reduce pollutants from industry.
- ☛ More efficient irrigation can minimize runoff of agricultural pollutants and reduce the use of fertilizers and pesticides.

Protection of Aquatic Habitats

- ☛ Building fewer and smaller new water projects can help preserve wetlands, which naturally treat pollutants.
- ☛ Diverting less water preserves more streamflow to maintain a healthy aquatic environment.

Protection of Drinking Water Sources

- ☛ Less pumping of groundwater lowers the chance that pollutants will be drawn into a water supply well.
- ☛ With less water use, septic system performance can improve, reducing the risk of groundwater contamination.
- ☛ Highest quality water sources are preserved for drinking water by using treated wastewater for other uses.

Energy Conservation

- ☛ Efficient water use means less power needed to pump and treat water and wastewater.
- ☛ Less water use reduces the amount of energy required for heating hot water.
- ☛ Less energy demand results in fewer harmful by-products from power plants.



Other Reasons to Use Water Wisely

Preventing pollution is only one reason why using water efficiently makes sense. Here are a few more:

Money Saved

- ☞ Less water use results in fewer pumping and treatment costs.
- ☞ Saving money on water and wastewater operations frees money for meeting water quality, public health and water treatment goals.
- ☞ Water saved is also energy, and money, saved for you and your community.

Improved Reliability

Water conservation provides a hedge against drought impacts.

- ☞ Improving water efficiency may be quicker and cheaper than developing a new supply.
- ☞ Reduced water use may extend the life of your water or wastewater facility.
- ☞ Reduced water use may increase the efficiency of wastewater treatment, and reduce overflows during storms.
- ☞ Communities which use water efficiently are better prepared to cope with effects of possible future climate change.



What Individuals Can Do

More efficient water use begins with individuals, in the home and place of work. Taking these and other steps, and encouraging others to do so, makes good economic as well as environmental sense.

In The Home

- ☞ Install a toilet dam or plastic bottle in your toilet tank.
- ☞ Install a water-efficient showerhead (2.5 gallons or less per minute).
- ☞ When you buy a new toilet, purchase a low flow model (1.6 gallons or less per flush).

Outdoors

- ☞ Water in the morning or evening, to minimize evaporation.
- ☞ Install a drip-irrigation watering system for valuable plants.
- ☞ Use drought-tolerant plants and grasses for landscaping, and reduce grass-covered areas.

At Work or School

- ☞ Adopt the same water-saving habits that are effective at home.
- ☞ Ask about installing water-efficient equipment and reducing outdoor water use.
- ☞ Encourage employers to explore the use of recycled "gray-water" or reclaimed wastewater.

Storm Drains are for Rain...

More than 150,000
times each month,

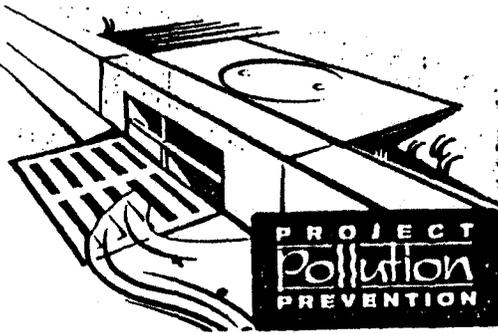
lawns and gardens throughout LA
County are sprayed with pesticides.



Overwatering or rain causes
pesticides on leaves and grass to flow
into the storm drain and to the ocean —
untreated.

Please use pesticides wisely, not before
a rain, and water carefully.

...not pesticides.



Pesticide Tips:



You can keep your lawn and garden green and at
the same time solve the pollution problem by
taking these easy steps...

- Never dispose of lawn or garden chemicals in storm drains. This is called illegal dumping. Take them to a household hazardous waste roundup. Call 1-888-CLEAN-LA to locate a roundup or collection facility near you.
- More is not better. Use pesticides sparingly. "Spot" apply, rather than "blanket" apply.
- Read labels! Use only as directed.
- Use non-toxic products for your garden and lawn whenever possible.
- If you must store pesticides, make sure they are in a sealed, water-proof container that cannot leak.
- When watering your lawn, use the least amount of water possible so it doesn't run into the street and carry pesticide chemicals with it. Don't use pesticides before a rain storm. You will not only lose the pesticide, but also will be harming the environment.



Storm Drains are for Rain...

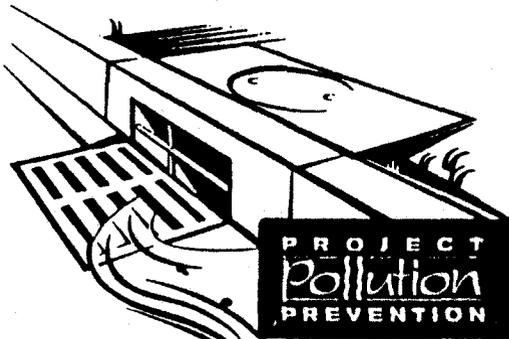
More than 150,000
times each month,



lawns and gardens throughout
LA County are overwatered. This
can cause fertilizers and pesticides
on grass and plants to flow into
storm drains and to the ocean,
untreated — harming the environment.

Please use fertilizers and pesticides
wisely, not before a rain, and water
carefully.

...not fertilizer.



Fertilizing Tips:



Fertilizers contain toxic chemicals that are harmful to people and the environment. You can keep your lawn and garden green and, at the same time, solve the pollution problem by taking these easy steps.

- Do not over-fertilize and do not fertilize near ditches, gutters or storm drains.
- Follow the directions on the label carefully.
- Do not overwater after fertilizing. Overflow water and your fertilizer will run into the street, down the storm drain and into the ocean. Do not fertilize before a rain.
- Store fertilizers and chemicals in a covered area and in sealed containers to prevent runoff.
- Do not blow, sweep, hose or rake leaves or other yard trimmings into the street, gutter or storm drain.



PROJECT
Pollution
PREVENTION

Printed on recycled paper



What Communities Can Do

A water supplier or wastewater system operator (public or private) has cost-effective options to process and deliver water more efficiently. A community can do the same, and can foster ways to use water wisely.

Not all of these steps are expensive. The best choices vary by region and by community; start by asking if these are appropriate where you live and work.

A Water Supplier or Wastewater Processor Can:

- ☛ Identify who uses water, and reduce unaccounted-for water use.
- ☛ Find and repair leaking pipes.
- ☛ Consider a new pricing scheme which encourages conservation.
- ☛ Reduce excess pressure in water lines.
- ☛ Explore the reuse of treated wastewater for uses other than drinking water.
- ☛ Charge hookup fees which encourage more efficient water use in new buildings.
- ☛ Build water efficiency into future demand projections, facility planning, and drought planning.

A Community Can:

- ☛ Adopt plumbing and building codes that require water-efficient equipment and practices.
- ☛ Adopt a water-efficient landscaping ordinance to reduce the water used for golf courses and commercial landscapes.
- ☛ Retrofit older buildings with water-efficient equipment, starting with public buildings.
- ☛ Reduce municipal water use for landscaping and other uses.
- ☛ Conduct a public education campaign.
- ☛ Require developers to build in water efficiency measures.



*For more information on what you and your
community can do to use water more
efficiently, contact:*

**U.S. Environmental Protection Agency
Office of Water
401 M Street, S.W.
Washington, D.C. 20460**



*For more information on pollution
prevention programs at U.S. EPA, contact:*

**U.S. Environmental Protection Agency
Office of Pollution Prevention
401 M Street, S.W.
Washington, D.C. 20460**

COUNTY OF ORANGE
ENVIRONMENTAL MANAGEMENT AGENCY

SANTA ANA, CALIFORNIA

REGULATION FUNCTION
Robert F. Wingard, Director

Prepared by
Chris Crompton, Manager, Environmental Resources Division
Richard Boon, Supervisor, Stormwater Section
and Ward Allebach, Environmental Resources Specialist

MANAGEMENT GUIDELINES
FOR USE OF FERTILIZERS AND PESTICIDES

March 12, 1993

MIKE RUANE
Director

ORANGE COUNTY BOARD OF SUPERVISORS

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Annual Progress Report
For Fertilizer and Pesticide Management

EXECUTIVE SUMMARY

This document was prepared to fulfill the commitment in the Orange County Drainage Area Management Plan (DAMP), Sections 5.2.9 and 5.2.10, which requires that co-permittees establish guidelines for the management of fertilizers and pesticides.

The main objective of these guidelines is to safeguard to "the maximum extent practicable" against unnecessary discharges of fertilizers and pesticides into surface and groundwater systems and to establish safe and reasonable standards for handling those materials. The guidelines are based on state and federal laws, environmental policies and "best management practices" established by various public and private agencies.

The County and many of the cities have already been following many of these guidelines. However, through this document, it is envisaged that these practices will be adopted by the County and all of the co-permittees to establish a set of uniform standards and procedures.

In addition to management guidelines, this document also includes a summary of the findings of the June 2 fertilizer and pesticide survey, specifically outlining and comparing different aspects of the policies and procedures of the co-permittees.

1.0 INTRODUCTION

1.1 Status of Fertilizer and Pesticide Use

Fertilizers and pesticides are primary tools of vegetation management. Used properly, fertilizers provide important nutrient supplies for vegetation and agriculture, and pesticides help to protect those resources from potential harm.

Used improperly, fertilizers and pesticides can become an impairment to surface and groundwater supplies. Careless application, mixing, transportation, storage and disposal allow chemicals to enter surface and groundwater through runoff and infiltration; the same handling problems endanger human health through exposure to toxic chemicals; soil degradation often results from overuse and misuse of pesticides and fertilizers. Even under ideal conditions, there is still a high level of risk, and consequently, there is a need for considerable professional planning and management.

1.2 Management Options

Because of the risk involved in using fertilizers and pesticides, the development of management guidelines for use of fertilizers and pesticides is an essential element of the Drainage Area Management Plan (DAMP). These guidelines are designed not only to comply with National Pollutant Discharge Elimination System (NPDES) permitting, but also to minimize any threat to human health and environmental resources from improper use of fertilizers and pesticides. It is envisaged that consideration of these guidelines by the co-permittees will cause public agencies to re-evaluate their approach to using fertilizers and pesticides and move toward reducing dependence on them.

The guidelines that follow are intended for the use of the co-permittees, although they may ultimately be used on a broaderscale. They are based on the laws, management guidelines and "best management practices" established by other federal, state and local agencies. They recognize that the safe management of fertilizers and pesticides is a shared responsibility between the field worker and management. These guidelines address the concern for fertilizer and pesticide use at a basic level, and if followed, they should reasonably prevent environmental damage to the highest degree possible.

1.3 Definitions

For the purpose of these guidelines, fertilizers may be referred to as "nutrients" or "soil nutrients," and the term "pesticides" will encompass all herbicides, insecticides, fungicides and rodenticides. The California Food and Agricultural Code and the California Code of Regulations Title 3 (3 CCR) constitute the laws and regulations referenced in this plan. They are referenced often and usually referred to as the "State Code." Also, co-permittees in the NPDES permits shared by the County and its incorporated cities will be referred to as "public agencies," and employees working for these public agencies who handle fertilizers and pesticides will be referred to as "workers" or "public employees."

2.0 FERTILIZER MANAGEMENT

2.1 Definition and Scope of Guidelines

Fertilizers are nutrients applied to soil to provide a better growing environment for plants. The fertilizers most commonly in use in Southern California today are nitrogen- and phosphorus-based. Both leach into soils easily in the presence of water and have become a water quality concern, causing algal blooms and eutrophication and, in some cases, causing levels to exceed federal drinking water standards.

However, fertilizers also play the important role of promoting vegetation growth that protects soil from erosion and enhances landscape aesthetics. Because there is a necessity for soil nutrients and because there is a potential for adverse effects on local waterways due to the loss of these nutrients through runoff and infiltration, management guidelines are necessary as a means of reducing the loss of fertilizers into water supplies.

2.2 General Considerations

2.2.1 State and Federal Law

Because most fertilizers are not as toxic as pesticides, state and federal lawmakers have not developed regulations for their use. Fertilizers are not usually considered an immediate danger to public health or safety. However, the California Fertilizer Association, a Sacramento-based organization, has developed complete management guidelines for fertilizer use and the State Department of Food and Agriculture has recommendations for use of nitrate-based fertilizers, both of which are available for consultation.

2.2.2 General Recommendations

- 1. Public agencies should periodically test soils before applying fertilizers to be certain that application is appropriate for and compatible with soil conditions. The samples should be analyzed by a qualified specialist, and workers should follow the recommendations for application.**
- 2. Public agencies should choose to use organic fertilizers such as compost, peat and mulch wherever possible to increase soil porosity and water retention.**
- 3. Workers should apply only the minimum amount of fertilizer needed and incorporate it directly into the soil around the plant where possible to minimize potential surface runoff.**
- 4. Workers should not apply fertilizers in the rain or on the same day that rain is expected.**
- 5. Workers should immediately cleanup any spill of fertilizers.**

6. Storage facilities should be covered and have impermeable foundations so that potential spills don't have the opportunity to runoff into surface water or leach into groundwater systems.
7. Fertilizers that may be carried by the wind should be stored in areas away from open loading spaces and entrances of storage warehouses.
8. Fertilizers should be securely covered in the vehicle before being taken to application sites so that none can spill or fly out during transport.
9. Use slow release fertilizers – such as water soluble nitrogen fertilizers, coated fertilizers and fertilizers of limited solubility – wherever possible to reduce the chances of leaching.

2.3 Planning for Use of Fertilizers

2.3.1 Soil Testing

Most fertilizers travel quickly through water. Therefore, fertilizers will leach through soil and potentially contaminate groundwater more quickly after excess watering or irrigation, after heavy rains and where the water table is high. For this reason, soil testing is an important management technique to determine the safest fertilizer application rate.

The California Landscape Contractors Association (CLCA) has a complete list of organizations in Southern California that offer soil testing and analyzing for fertilizer use. To get a copy of that list, CLCA can be contacted at (916) 448-2522. If a reliable soil analyst is not already known, it is advisable for public agencies to consult CLCA and research a specialist who can make recommendations for fertilizer use.

2.3.2 Application Rates

The amount of fertilizer needed for different applications depends on a number of factors. For specific recommendations, a qualified specialist should be consulted. However, some factors to be considered include:

- the vegetation's ability to use fertilizer;
- the amount of nutrients already in the soil, including fertilizer that may still be present from a previous application;
- the amount of soil nutrients that will or can be obtained from natural processes;
- expected loss of nutrients from the soil, and
- temperature at the time of application.

2.3.3 Timing

For vegetation with different growth patterns, fertilizers should be applied at different times and in different quantities. The vegetation being managed should be researched and fertilizers applied only according to the recommended amounts and at the recommended time intervals so that waste of fertilizer and risk of water contamination are minimized. This research should be incorporated in a recommendation from a qualified specialist for fertilizer applications.

2.4 Application Methods of Fertilizers

This section details the most common methods for application of fertilizers. These are not the only acceptable methods of fertilizer application. Every application has its own unique circumstances and variables to consider. A qualified fertilizer specialist should be consulted to recommend the most appropriate application method.

2.4.1 Banding of Fertilizer

Probably the most common and safest application method, this involves physically working small amounts of fertilizer into the soil in a band beneath and around the sides of a seed. It allows new roots to efficiently use the nutrients and minimizes potential nutrient loss to surface runoff. However, given the labor involved, banding may not be practical for most public agency fertilizer applications.

2.4.2 Foliar Fertilization

This is fertilizer applied in solution form that is absorbed through leaves and stems. The method can reduce nutrient leaching into the soil when applied correctly and can be performed at the same time as pesticide applications to avoid spraying twice. In the latter case, the guidelines for pesticide use must also apply.

2.4.3 Broadcast Application

By this method, dry or liquid fertilizer is uniformly spread over the soil surface. This is often done mechanically, an example being the "drop spreader," which is usually an inverted triangle hopper. The simplest of mechanical applicators, the drop spreader is commonly mounted on wheels and pushed by hand or pulled by vehicle to drop fertilizer out the bottom of the triangle.

Other types of broadcast applicators include spray booms for liquid fertilizer or "spinning disks" mounted on a moving vehicle that throw dry fertilizer into the air. It should be noted that these latter methods do not offer much control over fertilizer drift in adverse weather conditions.

2.4.4 Fertigation

Although not likely to be used by public agencies for fertilizer applications, this method is common among Californian farmers who incorporate fertilizers into irrigation water. The potential for nutrient leaching using this method, though, appears to be high.

2.5 Storage and Handling of Fertilizers

2.5.1 General Description

When stored and handled properly, fertilizers present no hazard to the users' health. Public employees responsible for storage and handling of fertilizers should be aware that some fertilizers have properties that can result in dangerous chemical reactions if mixed with other substances or under unusual conditions. For example, ammonium nitrate may become explosive if it becomes mixed in diesel fuel; a dehumidifier may be necessary for storage areas where sensitive fertilizers are stored. Also, because most fertilizers tend to be corrosive, concrete structures are preferred for fertilizer storage facilities.

2.5.2 Dry Fertilizer

In most cases, dry fertilizers are safe to store, transport and handle. However, because some fertilizers have unique, potentially dangerous properties, it is advisable for public agencies to consult a qualified fertilizer specialist for the safest storage and handling procedures for specific fertilizers.

2.5.3 Liquid Fertilizer

Fertilizers in liquid form are potentially more hazardous than dry fertilizer. Public employees responsible for storage and handling need to be aware of the specific properties of each liquid fertilizer in use, including corrosivity and tolerable temperature and pressure ranges. Protective equipment may be necessary for workers handling fertilizers such as sulfuric or phosphoric acid. A qualified fertilizer specialist should be consulted for recommending the safest handling and storage procedures for specific liquid fertilizers.

3.0 PESTICIDE MANAGEMENT

3.1 Definition and Scope of Guidelines

Pesticides are designed to kill or restrict the growth of plants and organisms, and thus, are potentially dangerous chemicals. Increasing scientific concern for their safe use and heightened public awareness of health concerns has led to more and more regulations in the United States at both the state and federal level. Pesticide use by public agencies often involves applications to keep flood control channels and roadways clear or to minimize health and safety hazards of disease-bearing rodents and insects – any of these applications can drain into stormwater basins if not controlled properly. Although safety concerns and the cost of complying with new regulations have encouraged some public agencies to cut back on the use of pesticides, use is still common, and their management is therefore essential.

3.2 General Considerations

3.2.1 State and Federal Law

The California Department of Food and Agriculture and the federal Toxic Substances Control Act (TSCA) have set forth extensive rules and regulations that must be met by all public agencies. At an absolute minimum, public agencies must comply with these laws or be subject to the penalties described in the statutes.

3.2.2 Chemical Labels and Materials Safety Data Sheets (MSDS)

1. Without exception, chemical labels provided by the manufacturer of each pesticide are the first source of recommendations and instructions for chemical use. Whenever a chemical is to be used by a worker or a contractor of a public agency, the user needs to be intimately familiar with the label instructions and requirements.

As described in the State Code (3 CCR, Ch. 2, Subch. 1, Art. 10), the label must appear on the immediate container of the chemical and include, in prominent, bold type, the appropriate warning or caution statement according to its toxicity classification. If a chemical is transferred to another container, a copy of the label should be transferred with it.

Workers should never handle a container that doesn't have a warning label attached, and the supervisor in charge should be immediately advised of the situation. If a label is badly damaged, it shall be replaced by the supervisor.

2. Workers using pesticides shall have readily available the Materials Safety Data Sheets (MSDS) for each chemical they are using. Although the MSDS is a form that may vary in appearance for different chemicals, the information is the same, as required by law. Similar to the chemical labels, these sheets contain information necessary to handle each chemical safely, and all workers shall be familiar with the information.

MSDS sheets include chemical identifications, hazardous ingredients, physical data, fire and explosion data, health hazards, reactivity data, spill or leak cleanup procedures, special protection and special precautions.

3.2.3 General Recommendations

1. Public agencies should maintain a complete list of all chemicals and their uses.
2. Public agencies should thoroughly investigate and consider all alternatives to pesticide use.
3. Workers shall use pesticides only according to label instructions.
4. Work crews should bring to the work site only the amount of chemical to be used during the application and use only the minimum amount of the chemical that is necessary.
5. Workers should consider weather conditions that could affect application (for example, they shouldn't spray when winds are exceeding 5 mph, when raining or when rain is likely).
6. Workers should consider area drainage patterns (for example, they shouldn't apply near wetlands, streams and lakes or ponds unless it is for an approved maintenance activity).
7. Workers should consider soil conditions before applying pesticides (for example, they shouldn't apply to bare or eroded ground).
8. Workers shall triple-rinse empty pesticide containers before disposal and use the leftover wash as spray.
9. Workers should never clean or rinse pesticide equipment and containers in the vicinity of storm drains.
10. Pesticides should only be stored in areas with cement floors and in areas insulated from temperature extremes.
11. Workers shall secure chemicals and equipment during transportation to prevent tipping or excess jarring in a part of the vehicle completely isolated from people, food and clothing.
12. Workers or their supervisors should inspect pesticide equipment, storage containers and transportation vehicles daily.
13. Public agencies should adopt a plan for dealing with potential accidents before they happen.

14. Workers should immediately clean up any chemical spill according to label instructions and notify the appropriate supervisors and agencies.

3.3 Planning for the Use of Pesticides

3.3.1 Selection of Appropriate Pesticides

1. Pesticides are to be used only after recommendation from a state-licensed pest control advisor.
2. Public agencies should seek advice for appropriate pesticide use from the Orange County Agricultural Commission, from other professional pesticide handlers and/or through professional publications. The County Agricultural Commission can be contacted at (714) 447-7100.
3. A special effort should be made to limit use of restricted pesticides and all other Category One pesticides.

3.3.2 Certification, Licensing and Permitting

1. Pesticides are only to be applied by or under the direct supervision of a state-licensed or certified pesticide applicator or by workers with equivalent training.
2. Chemicals listed as "restricted" in the State of California may be used only under a restricted materials permit (3 CCR Ch. 2, Subch. 4) to be issued by the Orange County Agricultural Commission. The permit must be renewed annually for continued use. For more information, contact the Commission at (714) 447-7100.
3. Other guidelines concerning permits, licensing and certification that need to be followed before pesticide application are detailed in the State Code (3 CCR, Ch. 3, Subch. 1).

3.3.3 Employee Training

1. Public agency employees must know the information on the chemical label and its MSDS before using pesticides in any capacity. In addition, they shall (a) know the immediate and long-term health hazards posed by chemicals to be used, the common symptoms of chemical poisoning and the ways poisoning could occur, and (b) know the safe work practices to be followed, including the appropriate protective clothing, equipment, mixing, transportation, storage, disposal and spill cleanup procedures that apply to the specific chemicals being used.
2. In addition to the training and annual continuing education required by State Law for licensing and certification (3 CCR, Ch. 3, Subch. 3, Art.2), public employees are

encouraged to participate in continuing pesticide education programs whenever programs are available.

3.3.4 Accident Mitigation

Public agencies using pesticides should have plans for dealing with potential accidents before they happen. These plans should consider:

1. **Labels and MSDS Sheets** -- All workers handling pesticides must be familiar with these instructions. The steps for accident mitigation are spelled out on chemical labels and MSDS sheets.

2. **Spill Cleanup Kits** -- Any time pesticides are being handled, there should be a cleanup kit on hand in case of an accident. This means there should always be a cleanup kit located in pesticide storage areas, on vehicles used to transport pesticides and on location where the chemicals are being applied. Although these kits may vary in what they contain depending on the chemical type and the situation, at a minimum they should include:

- * spill-control procedures;
- * a five gallon drum with sealable lid;
- * a dust pan and broom;
- * a squeegee;
- * a shovel;
- * protective goggles, gloves, boots, coveralls;
- * a tarp (for covering dry spills);
- * detergent and water (check label or MSDS for proper use);
- * barricade tape, florescent traffic safety cones or string to cordon off an area, and
- * large sponges, containment booms or some other absorbent material.

3. **Cleanup Procedures** -- Spilled pesticides must be prevented from entering the local surface and/or groundwater supplies. Specific recommendations for spill cleanup should be available on each chemical label or MSDS. Specific recommendations for the sequence of procedures may also vary depending on the situation. However, generally, in case of a spill, the responsible worker(s) should:

EVALUATE the accident and quickly determine the most immediate concerns (medical and/or environmental).

CONTAIN OR CONTROL the spill.

NOTIFY the supervisor in charge who should, in turn, notify the proper authorities. If contact cannot be made, dial 911.

ISOLATE the area with fluorescent traffic safety cones, ropes or some other cordoning device to be sure that no one walks, wanders or drives through the spill area.

CLEAN UP the spill as best as possible following label instructions and using the appropriate spill cleanup kit.

EVALUATE any damage that may have occurred resulting from the spill (property damage, health damage, equipment damage, etc.) and make notes on all relevant details and circumstances before leaving the scene.

PREPARE A COMPLETE REPORT detailing the incident immediately after leaving the scene upon returning to the work place and submit it to the immediate supervisor.

3.3.5 Emergency Medical Care

Accident situations requiring emergency medical care are likely to involve acute exposure to potentially toxic chemicals. Instructions for handling these exposures appear on the chemical label. Workers should:

1. Be aware of the symptoms of acute exposures for each chemical being used.
2. Have a predetermined strategy for dealing with exposure scenarios, including knowing (a) the label recommendations for dealing with acute exposures and (b) the nearest medical facility where emergency care is available.

3.3.6 Equipment and Equipment Maintenance

All equipment for the handling of pesticides should be inspected and cleaned by workers before each use to ensure that there are no problems that could lead to chemical leaks, spills or accidents during the day's work (3 CCR, Ch. 3, Subch. 3, Art. 2).

3.3.7 Groundwater and Surface Water Protection

Similar to the discussion of leaching in fertilizer management, the main factors determining the rate at which pesticides enter groundwater and surface water systems are chemical mobility, solubility and persistence and the soil type. For example, potentially dangerous chemicals are likely to have a high solubility and an extremely long half-life, and they are not likely to be easily absorbed into the soil. Therefore, chemicals that decompose rapidly may be preferred. However, note that to choose a chemical that may need to be applied two or three times as often may not make sense from a transportation and application risk standpoint.

Because of these factors, regardless of the category of chemicals being used, pesticide advisors should periodically test the soil for compatibility with specific chemicals before recommending pesticides for a specific area.

Furthermore, because the effect of these uses is not always immediately apparent, public agencies should periodically test areas that could be particularly vulnerable to contamination or deterioration. The results of these tests should be kept on public record.

3.4 Application of Pesticides

3.4.1 Supervision

1. In cases where supervision of pesticide applications is required by the State Code, supervision must be handled by a state-licensed or certified pesticide applicator. For all other pesticides applications, supervision may be handled by workers with equivalent training.

2. Public agencies that contract for pesticide applications should periodically inspect contracted work crews to be certain that contractors are following proper management guidelines. Public agencies handling their own applications should likewise inspect their own work crews on a regular basis to ensure that safety standards are being met.

3.4.2 Proper Techniques

1. Read the label carefully and follow application instructions. Be absolutely certain that the right chemical is being used for the right job before applying.

2. To prevent potentially harmful runoff, only the absolute minimum amount of pesticides should be used to ensure vegetation safety.

3. Recommendations for best weather conditions to prevent pesticide spray drift are outlined in the State Code, Chapter 2, Subchapter 4, Article 2.

3.4.3 User Safety and Protection

1. Public agencies shall have on hand equipment for application of pesticides including eye protection, gloves, respiratory gear and impervious full-body, chemical resistant clothing when called for by the chemical label.

2. Even when wearing respiratory gear or masks, when dealing with spray applications of pesticides, workers should avoid directly inhaling in the spray mist.

3. Workers should avoid working alone, especially at night.

4. Workers should clean equipment, clothing and self thoroughly after each application.

5. State laws regarding re-entry into fields that have recently been treated with pesticides shall be followed (3 CCR, Ch.3, Subch. 3, Art. 3).

6. Public agencies are responsible for knowing and informing workers about the specific pesticides being used including how they are properly handled, the dangers involved and the proper training and safety procedures.

7. Public agencies are responsible for keeping updated records and a complete list of the pesticides being used in their jurisdiction. This should include the chemicals, amount in storage, amount of applications, dates and location of applications and pests controlled with each application.

8. Public agencies shall keep all relevant label and MSDS information for each chemical updated and readily available at all times to workers handling the materials.

3.5 Storage, Disposal and Transportation

3.5.1 Proper Storage

1. Storage areas should be away from living areas and in a covered area that is well-insulated from temperature extremes; they should have a cement floor and good ventilation. Also, storage areas should be clearly marked according to state standards and be securely locked at all times when not in use.

2. Public agencies shall ensure that chemical labels on pesticides being stored or used are kept in good condition and attached to all containers holding pesticides (3 CCR, Ch. 3, Subch. 2, Art. 4).

3. Workers should ensure that storage equipment and containers are inspected daily for leaks or defects before being taken on the job. Containers should also be inspected and before storing at the end of the day.

3.5.2 Proper Disposal

1. Workers shall make certain that chemical containers are triple-rinsed before disposal (3 CCR, Ch. 3, Subch. 2, Art.

2. It is recommended that cleaned containers be sent back to the manufacturer for recycling whenever possible. However, once triple-rinsed, most haulers will take them to most landfills.

3. Workers should use left over rinse water as spray.

4. Public agencies should ensure that surplus or out-of-date chemicals are given to a licensed hazardous waste hauler for disposal.

3.5.3 Safe Transportation Methods

1. Before transporting pesticides, workers shall ensure that all pesticide containers are tightly sealed and secured from tipping or excess jarring (3 CCR, Ch. 3, Subch. 2, Art. 4).

2. Transportation compartments on vehicles shall be isolated from the compartment carrying people, food and clothing and should be securely locked (3 CCR, Ch. 3, Subch. 2, Art. 4).

3. Workers should transport only the amount of pesticide needed for the day to the site.

4. Workers should be certain that the appropriate chemical labels and MSDS sheets, a spill cleanup kit, the location of emergency medical care and a first aid kit are always brought along when transporting pesticides.

5. Public agencies should encourage all vehicles used for pesticide transportation to include radio communications for contacting help in case of a spill or some other emergency.

4.0 INTEGRATED PEST MANAGEMENT (IPM)

4.1 Background on Pesticide Use

For most of the last 50 years, the trend in vegetation management has been toward a greater reliance on pesticides. The result has been not only an enormous increase in the use of many dangerous chemicals, but also an enormous increase in the number of pests that are resistant to the pesticides being produced -- in essence, as more pesticides have been produced, more resistant strains of pests have evolved. Worse, recent studies have shown that the end result of this global trend has been no net gain in vegetation survival rates.

With these realizations becoming well-known, vegetation managers are now moving away from their reliance on pesticides and toward an integrated approach that combines limited pesticides use with more environmentally-friendly pest control techniques.

4.2 Scope of Guidelines

For public agencies in Orange County, IPM practices should be preferred to the sole use of pesticides as the primary means of vegetation management. These techniques are designed to prevent overuse and to reduce reliance on them. IPM should be considered by all public agencies or their contractors before intensive use of pesticides.

The goal of IPM is not to eliminate all pests, but to keep their populations at a manageable number. Pesticides are part of IPM techniques, but they are used in small quantities and only after all other alternatives have been reviewed.

4.3 Alternatives to Pesticides

Some of the alternatives to pesticides that may be considered as part of an IPM program include:

1. Introduction of natural predators such as ladybugs, lacewings, garter snakes and toads. Also, some bacteria, viruses and insect parasites may be preferable to pesticides.
2. Selected removal or rotation of vegetation habitat to eliminate the breeding places of specific pests.
3. Weeding, hoeing and trapping manually. Pruning and thinning of trees is also an effective means of preventing epidemic tree insects and diseases.

Also, at certain times of the year and under certain environmental conditions, certain pests can be expected. Therefore, timely planting or well-timed use of small quantities of pesticides may avoid the need for some chemical use.

GLOSSARY

TERMS, ABBREVIATIONS, ACRONYMS

RELATED TO THE MANAGEMENT GUIDELINES FOR USE OF FERTILIZERS AND PESTICIDES

Best Management Practices (BMPs)

Schedules of activity, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

California Code of Regulations Title 3, Division 6 (3 CCR)

The State of California code regulating pesticides and pest control operations.

California Fertilizer Association (CFA)

An organization promoting progress in the fertilizer industry in the interest of an efficient and profitable agricultural community. Activities of CFA include developing and disseminating new information to its members and others; supporting production-oriented research programs to identify maximum yield systems for farmers; promoting agronomic topics at our schools, colleges and universities; and maintaining open communications among the industry, universities and other state and federal agencies.

Chemical Labels

As required by federal law, manufacturers of pesticides must provide chemical labels on the containers of all pesticides distributed. These labels include all necessary information on the chemical constituents of the pesticide, including recommendations and instructions for use, toxicity classification and the appropriate warning statements and emergency procedures in case of acute exposures. As required by state law, labels must be kept in good, readable condition and be attached to all pesticide containers at all times.

Co-permittee

A permittee to an NPDES permit that is responsible for permit conditions relating to the discharge for which it is operator. As used in the Stormwater Permit Implementation Agreement, co-permittees are the County of Orange, its incorporated cities and the Orange County Flood Control District.

Drainage Area Management Plan (DAMP)

A document required under the municipal NPDES stormwater permits granted to the co-permittees by the Santa Ana and San Diego Regional Water Quality Control Boards.

Equivalent Training

A term referring to public agency employees dealing with the application of pesticides who have not received a qualified applicator's license (QAL) from the State of California but who has completed a training course in pesticide application offered by the County of Orange.

Eutrofication

A decrease of dissolved oxygen in a body of water to such an extreme extent that plant life is favored over animal life. For example, a lake that has been overgrown in algae on the surface is likely in a state of eutrofication.

Integrated Pest Management (IPM)

The trend in vegetation management which supports moving away from reliance on pesticides and toward an integrated approach of limited pesticide use with more environmentally-friendly pest control techniques.

Materials Safety Data Sheet (MSDS)

Similar to chemical labels and also required by federal law, these sheets contain all information necessary for the safe handling of pesticides. They include chemical identifications, hazardous ingredients, physical data, fire and explosion data, health hazards, reactivity data, spill or leak cleanup procedures, special protection and special precautions.

Maximum Extent Practicable (MEP)

MEP means taking into account equitable considerations of competing factors including, but not limited to, the gravity of the problem, fiscal feasibility, public health risks, societal concern and social benefits.

National Pollutant Discharge Elimination System (NPDES)

The national program under the Clean Water Act for controlling discharges from point source discharges directly into the waters of the U.S.

Pest Control Advisor (PCA)

Certification obtained from the State of California after demonstrating an adequate knowledge of pests, pesticides and the implications of pesticide use. A recommendation for pesticide use must be obtained from a PCA before public agencies may approve any pesticide applications.

Qualified Applicators License (QAL)

A license obtained from the State of California after demonstrating adequate knowledge of the proper techniques for handling, storing, transporting and applying pesticides. Workers must obtain a QAL before being permitted to apply or supervise application of Category One pesticides.

Qualified Fertilizer Specialist

A person designated by the governing public agency who is knowledgeable of the proper techniques for handling, storing, transporting and applying fertilizers as defined in the Management Guidelines for Use of Fertilizers and Pesticides. This person shall be able to sample, inspect, test and make analyses of fertilizers that are in use or being considered for use in the agency's jurisdiction to such an extent that may be necessary to comply with the management guidelines.

Restricted Materials Permit

A permit that must be acquired by any public agency before application of any one of the pesticides listed as restricted by the State of California in the State Code of Regulations Title 3, Division 6. In Orange County, this permit must be obtained from the County Agricultural Commissioner.

State Code

In this report, referring to the State of California Code of Regulations Title 3, Division 6 and referenced as "3 CCR."

Storm Drain

Pipe or channel structure designed to convey only stormwater runoff for purposes of flood protection. Federal regulations use the term "storm sewer." Use of the word "sewer" for a stormwater conveyance structure should be discouraged, since the word "sewer" also includes sanitary sewers and combined sewers which carry human waste.

Toxicity Classification

Pesticides are grouped into three categories by the California Department of Food and Agriculture according to their toxicity or potential for causing injury to people. Category One pesticides are the most hazardous and their use is normally restricted, while Category Three pesticides are least toxic to people and are generally less hazardous.

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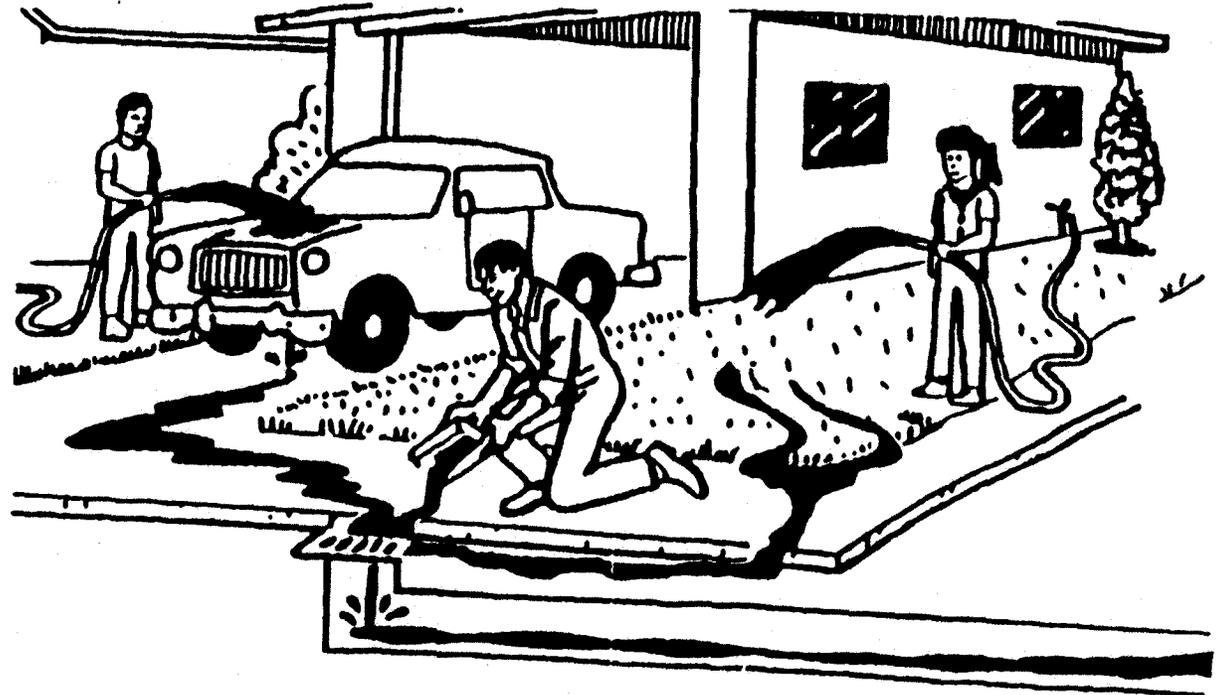
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**Stormwater pollution . . .
is fouling our water!**

Every day, water from garden hoses, sprinklers and rainfall washes pollutants off roads and yards . . . right into neighborhood storm drains. Storm drains carry untreated water and pollutants **directly** to our water resources.

**Twenty Ways
to
Protect Your Water**

Some pollutants, such as grease and dirt from streets, reach the storm drains unintentionally. But, many pollutants like used motor oil, detergents, paints, and solvents, are carelessly dumped into the storm drains.

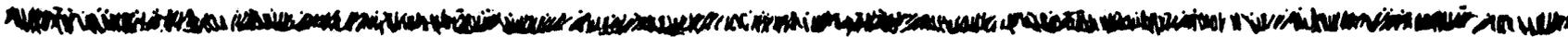


**You Can Make
A Difference!**

Polluted stormwater harms wildlife, jeopardizes the use of our rivers and lakes for recreation . . . and may eventually contaminate the water we drink!



HEALTHY LAWN, HEALTHY



Caring for Your Lawn in an Environmentally Friendly Way



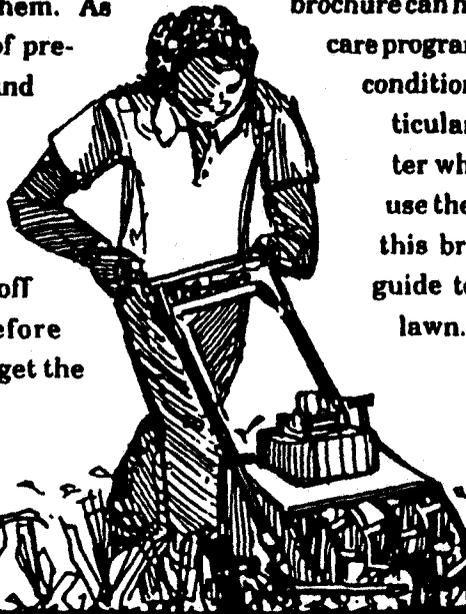
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Picture a healthy green lawn: perfect for lounging, great for ball games and cookouts, a real asset to your home. But did you know that your lawn—and how you take care of it—can also help the environment?  Healthy grass provides feeding ground for birds, who find it a rich source of insects, worms, and other food. Thick grass prevents soil erosion, filters contaminants from rainwater, and absorbs many types of airborne pollutants, like dust and soot. Grass is also highly efficient at converting carbon dioxide to oxygen, a process that helps clean the air.  Caring for your lawn properly can both enhance its appearance and contribute to its environmental benefits. You don't have to be an expert to grow a healthy lawn. Just keep in mind that the secret



Working With Nature: A Preventive Health Care Program For Your Lawn

To start, think about lawn care as a *preventive* health care program, like one you would use to keep up your own health. The idea is to prevent problems from occurring so you don't have to treat them. As they say, an ounce of prevention is worth a pound of cure. A healthy lawn can out-compete most weeds, survive most insect attacks, and fend off most diseases—before these problems ever get the upper hand.



Your lawn care program should be tailored to local conditions—the amount of rainfall you get, for example, and the type of soil you have. The sources listed at the back of this brochure can help you design a lawn care program that suits both local conditions and your own particular needs. But no matter where you live, you can use the program outlined in this brochure as a general guide to growing a healthy lawn.

A preventive health care program for your lawn should have the following steps:

1. Develop healthy soil
2. Choose a grass type that thrives in your climate
3. Mow high, often, and with sharp blades
4. Water deeply but not too often
5. Correct thatch build-up
6. Set realistic goals

1. Develop Healthy Soil

Good soil is the foundation of a healthy lawn. *To grow well, your lawn needs soil with good texture, some key nutrients, and the right pH, or acidity/alkalinity balance.*

Start by checking the texture of your soil to see whether it's heavy with clay, light and sandy, or somewhere in between. Lawns grow best in soil with intermediate or "loamy" soils that have a mix of clay, silt, and sand. Whatever soil type you have, you can probably improve it by periodically adding organic matter like compost, manure, or grass clippings. Organic matter helps to lighten a predomi-

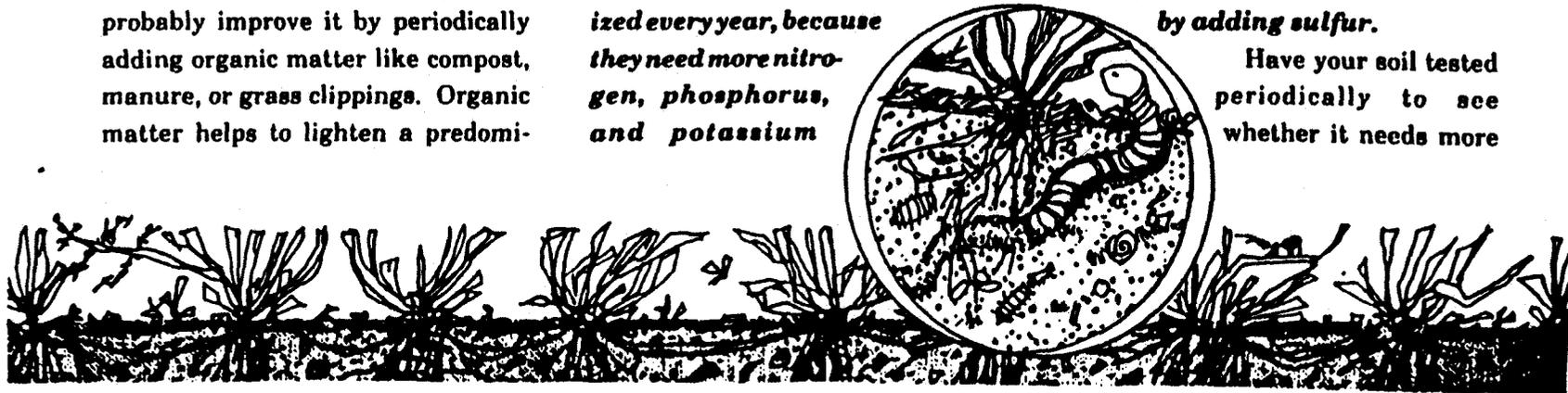
nantly clay soil and it helps sandy soil retain water and nutrients.

Also check to see if your soil is packed down from lots of use or heavy clay content. This makes it harder for air and water to penetrate, and for grass roots to grow. To loosen compacted soil, some lawns may need to be aerated several times a year. This process involves pulling out plugs of soil to create air spaces, so water and nutrients can again penetrate to the grass roots.

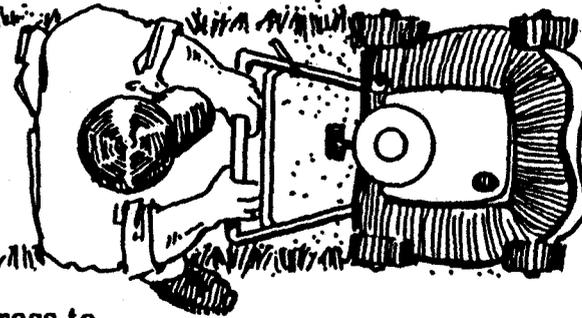
Most lawns need to be fertilized every year, because they need more nitrogen, phosphorus, and potassium

than soils usually contain. These three elements are the primary ingredients found in most lawn fertilizers. It's important not to over-fertilize—you could do more harm to your lawn than good—and it's best to use a slow-release fertilizer that feeds the lawn slowly. It's also important to check the soil's pH. Grass is best able to absorb nutrients in a slightly acidic soil, with a pH of 6.5 to 7.0. Soil that is too acidic can be "sweetened" with lime; soil that's not acid enough can be made more "sour" by adding sulfur.

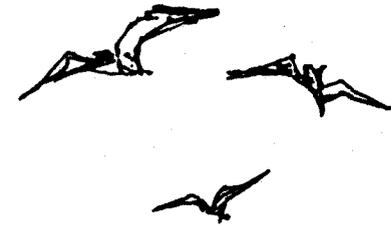
Have your soil tested periodically to see whether it needs more



ENVIRONMENT



is to work with nature. This means creating conditions for grass to thrive and resist damage from weeds, disease, and insect pests. It means setting realistic goals for your lawn, whether you or a professional lawn care service will be doing the work. And if you choose to use pesticides, it means using them with care so as to get the most benefit and reduce any risks. ☼ Caring for your lawn in an environmentally sensible way can have a bigger impact than you might think. Your lawn is only a small piece of land, but all the lawns across the country cover a lot of ground. That means you and your lawn care activities, along with everyone else's, can make a difference to the environment. And that's why taking care of the environment begins in our own backyards.



organic matter or the pH needs adjusting. Your county extension agent (listed in your phone book under county government) or local nursery should be able to tell you how to do this. These experts can also help you choose the right fertilizer, compost, and other "soil amendments," and they can advise you about aerating if your soil is compacted. If a professional service takes care of your lawn, make sure it takes these same steps to develop good soil. There's no getting around it: your lawn's health is only as good as the soil it grows in.



2. Choose A Grass Type That Thrives In Your Climate

The right type of grass—one that suits your needs and likes the local weather—will always give better results. Grasses vary in the type of climate they prefer, the amount of water and nutrients they need, their resistance to pests, their tolerance for shade, and the degree of wear they can withstand.

If you are putting in a new lawn, it will be worth your while to do some research to identify the best grass type for your needs.

If you're working with an established lawn that fails to thrive despite proper care, you might consider replanting with a different type of grass.

Why struggle to grow grass that's susceptible to fungal disease if you live in a humid climate? Or a water-loving species if you live in an area with water shortages? Grass that is well-adapted to your area will grow better and resist local pests and diseases better.

New grass varieties and mixtures come out on the market every year.

Ask your county extension agent or another one of the sources listed in this brochure for recommendations.



3. Mow High, Often and With Sharp Blades

Mowing high—that is, keeping your lawn a bit long—will produce stronger, healthier grass with fewer pest problems.

Longer grass has more leaf surface to take in sunlight. This enables it to grow thicker and develop a deeper root system, which in turn helps the grass survive drought, tolerate insect damage, and fend off diseases. Longer grass also shades the soil surface keeping it cooler, helping it retain moisture, and

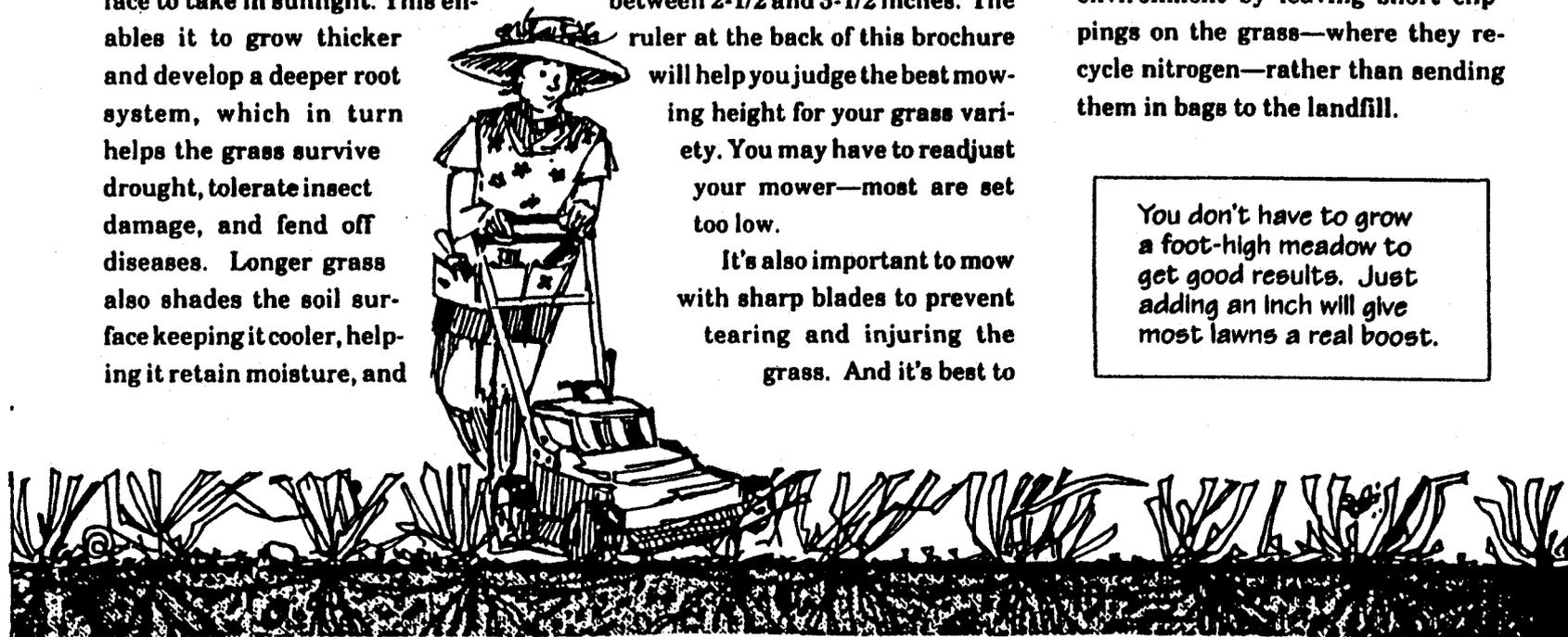
making it difficult for weeds to germinate and grow.

A lawn's ideal length will vary with the type of grass, but many turf grass species are healthiest when kept between 2-1/2 and 3-1/2 inches. The ruler at the back of this brochure will help you judge the best mowing height for your grass variety. You may have to readjust your mower—most are set too low.

It's also important to mow with sharp blades to prevent tearing and injuring the grass. And it's best to

mow often, because grass adjusts better to frequent than infrequent mowing. ***The rule of thumb is to mow often enough that you never cut more than one-third of the height of the grass blades.*** Save some time and help your lawn and the environment by leaving short clippings on the grass—where they recycle nitrogen—rather than sending them in bags to the landfill.

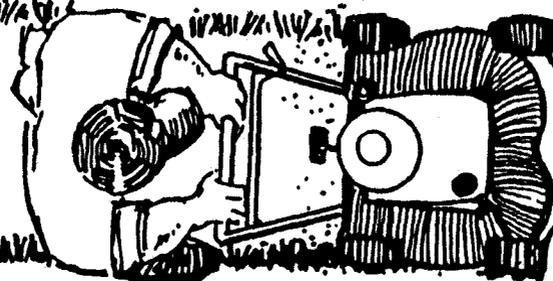
You don't have to grow a foot-high meadow to get good results. Just adding an inch will give most lawns a real boost.



Prevention, Pesticides
And Toxic Substances
(97804C)

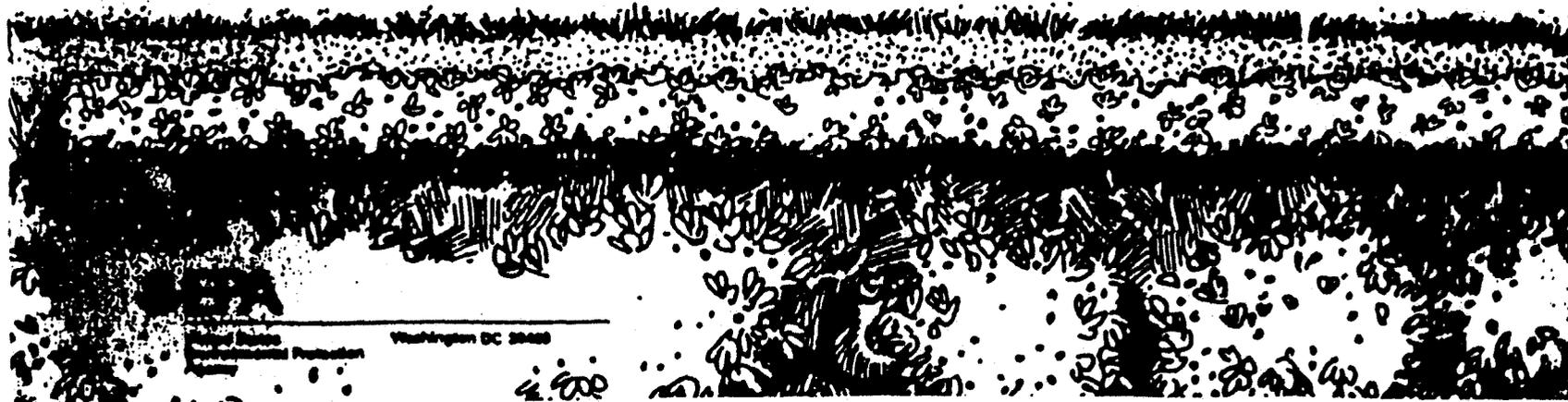
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June 1992

Healthy Lawn



Healthy Environment

Caring for Your Lawn in an Environmentally Friendly Way



U.S. EPA
Environmental Protection
Agency

Washington DC 20460

4-9200

4. Water Deeply But Not Too Often

Watering properly will help your lawn grow deep roots that make it stronger and less vulnerable to drought. Most lawns are watered too often but with too little water. *It's best to water only when the lawn really needs it, and then to water slowly and deeply.* This trains the grass roots down. Frequent shallow watering trains the roots to stay near the surface, making the lawn less able to find moisture during dry periods.

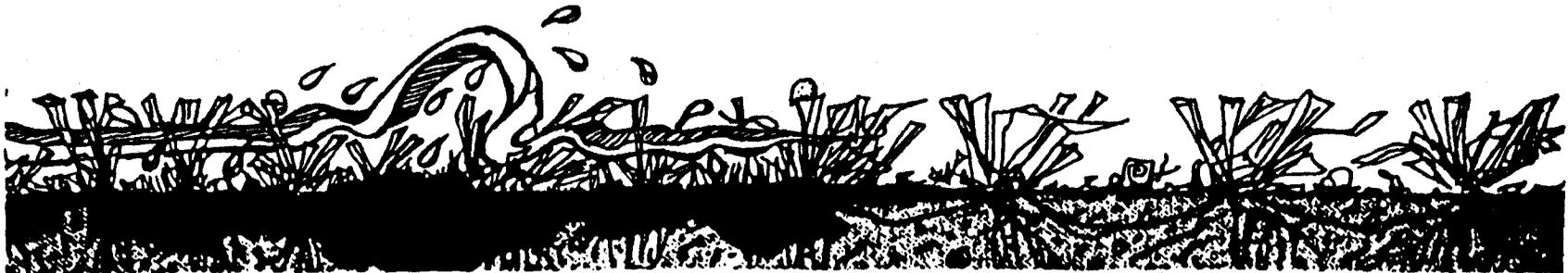
Every lawn's watering needs are unique: they depend on local

rainfall, the grass and soil type, and the general health of the lawn. But even in very dry areas, no established home lawn should require daily watering.

Try to water your lawn in a way that imitates a slow, soaking rain, by using trickle irrigation, soaker hoses, or other water-conserving methods. It's also best to water in the early morning, especially during hot summer months, to reduce evaporation. Apply about an inch of water—enough that it soaks 6–8 inches into

the soil. Then let the lawn dry out thoroughly before watering it again.

The best rule is to water only when the lawn begins to wilt from dryness—when the color dulls and footprints stay compressed for more than a few seconds.

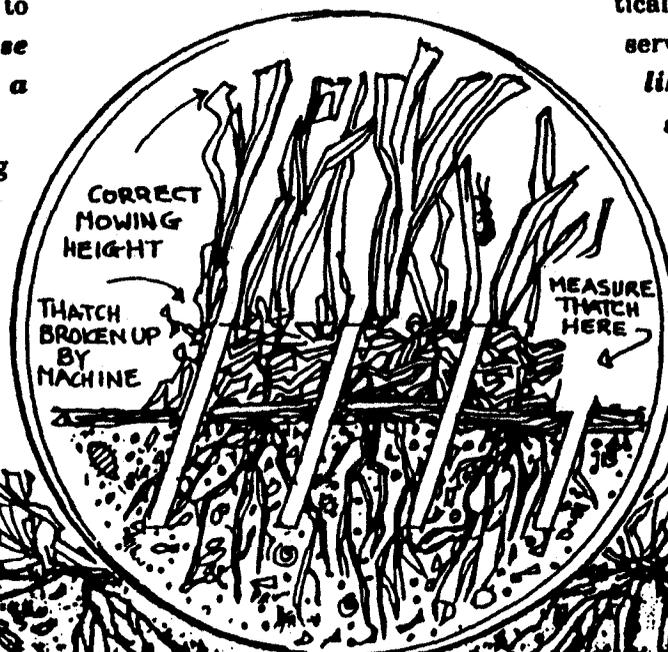


5. Correct Thatch Build-Up

All grass forms a layer of dead plant material, known as thatch, between the grass blades and the soil. When thatch gets too thick—deeper than one-half inch—it prevents water and nutrients from penetrating to the soil and grass roots. Some grasses tend to form a thick layer of thatch. *Overuse of fertilizer can also create a heavy layer of thatch.*

You can reduce thatch by raking the lawn or using a machine that slices through the thatch layer to break it up. Sprinkling a thin layer of topsoil or compost over the lawn will also help.

In a healthy lawn, microorganisms and earthworms help keep the thatch layer in balance by decomposing it and releasing the nutrients into the soil.



6. Set Realistic Goals

Setting realistic goals will allow you to conduct an environmentally sensible lawn care program. It's probably not necessary to aim for putting-green perfection. Did you know that a lawn with 15 percent weeds can look practically weed-free to the average observer? *Even a healthy lawn is likely to have some weeds or insect pests. But it will also have beneficial insects and other organisms that help keep pests under control.*

Also realize that grass just can't grow well in certain spots. Why fight a losing battle

with your lawn, when you have other options? At the base of a tree, for example, you might have better luck with wood chips or shade-loving ornamental plants like ivy, periwinkle, or pachysandra. If your climate is very dry, consider converting some of your lawn to dry-garden landscaping. It could save time, money, and water resources.

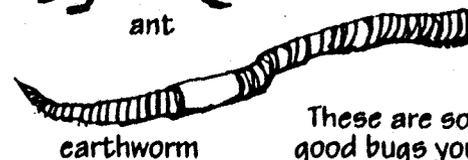
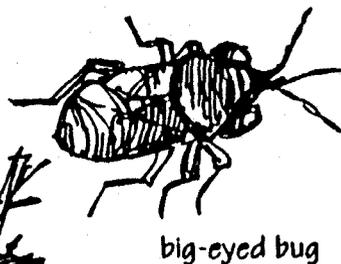
What Is IPM?

Integrated Pest Management is essentially common-sense pest control. IPM is not a new concept; some forms of it have been practiced for centuries.

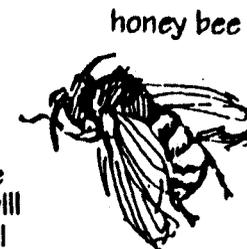
IPM involves the carefully managed use of three different pest control tactics—biological, cultural, and chemical—to get the best long-term results with the least disruption of the environment. Biological control means using natural enemies of the pest, like lady bugs to control aphids. Cultural or horticultural control in-

volves the use of gardening methods, like mowing high to shade out weeds. Chemical control involves the judicious use of pesticides.

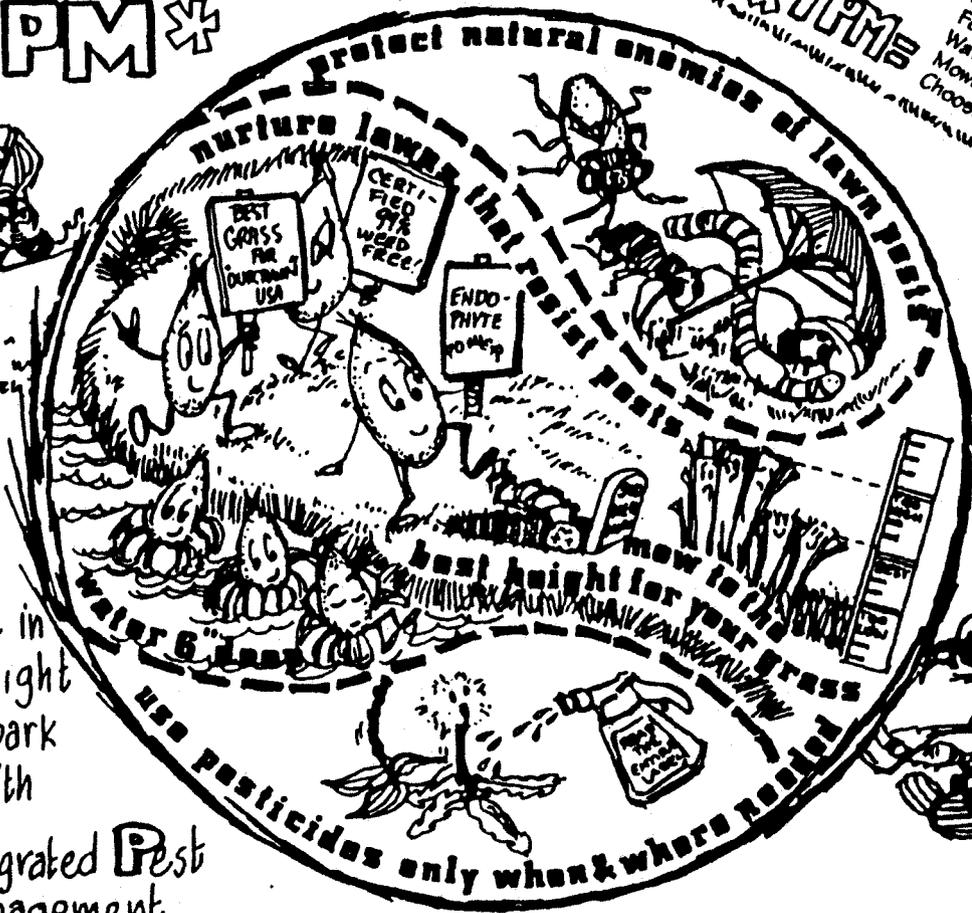
IPM is a highly effective approach that minimizes the use of pesticides and maximizes the use of natural processes. Lawn care professionals who use IPM should have a sophisticated understanding of the ecosystem of your turf and the available pest control tactics. Home gardeners can also practice IPM by following the steps outlined in this brochure.



These are some good bugs you will not want to kill!



IPM*



IPM*

- Protecting the Environment
- Fertilizing only when Needed
- Watering Properly
- Mowing High
- Choosing Best Pest Control Methods
- Aerating
- Setting Thresholds
- Monitoring
- Dethatching



you're in
the right
Ballpark
with
*
Integrated Pest
Management



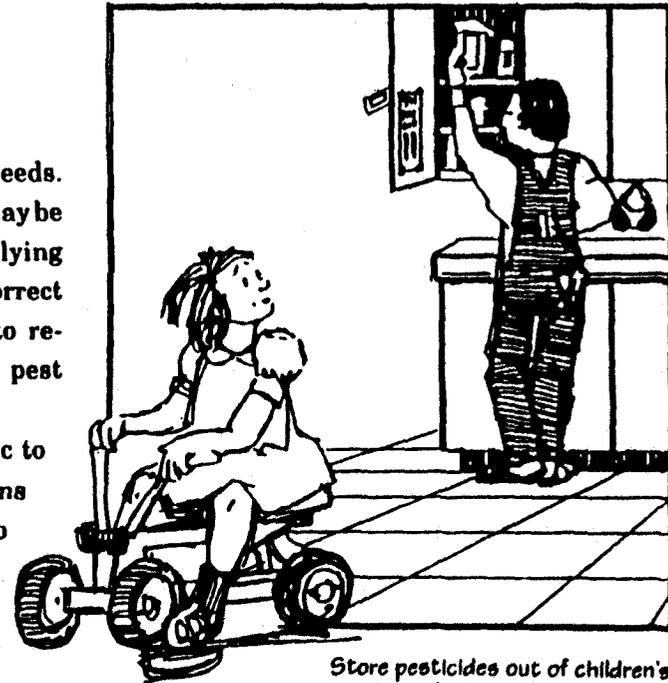
Tips For Using Pesticides

Sometimes, even with good lawn care practices, weather conditions or other factors can cause pest problems to develop. Pesticides can help control many lawn pests. But pesticides have risks as well as benefits, and it's important to use them properly.

The chemicals we call pesticides include insecticides, herbicides, and fungicides. These products are designed to kill or control pest insects, weeds, and fungal diseases. Pesticides can be very effective. But don't be tempted to rely solely on pesticides as a quick-fix solution to any lawn problem. Serious, ongoing pest problems are often a sign that your lawn is

not getting everything it needs. In other words, the pests may be a symptom of an underlying problem. You need to correct the underlying problem to reduce the chance that the pest will reappear.

All pesticides are toxic to some degree. This means they can pose some risk to you, to your children and pets, and to any wildlife that venture onto your lawn—especially if these chemicals are overused or carelessly applied. Pesticides can also kill earthworms and other beneficial



Store pesticides out of children's reach in a locked cabinet or garden shed.

organisms, disrupting the ecological balance of your lawn.



2. Use pesticides to minimize pests, not eradicate them. The latter is often impossible and unnecessary.
3. Be sure you have accurately identified the pest so you can choose the best pesticide for the job and use it most effectively. Obtain professional advice from your county extension agent or a local expert.

4. Spot treat whenever possible. In most cases, it isn't necessary to treat the whole lawn with pesticides if the problem is confined to certain areas. Spraying more than necessary is wasteful and can be environmentally damaging.



If you have questions about a pesticide, call EPA's toll-free National Pesticide Telecommunications Network (1-800-858-7378). For general information on minimizing pesticide risks, call or write EPA for a free copy of the *Citizen's Guide to Pesticides*. The number to call is 703-305-5017; the address is: EPA, Office of Pesticide Programs, Field Operations Division, H7506C, 401 M Street, S.W., Washington, D.C. 20460.

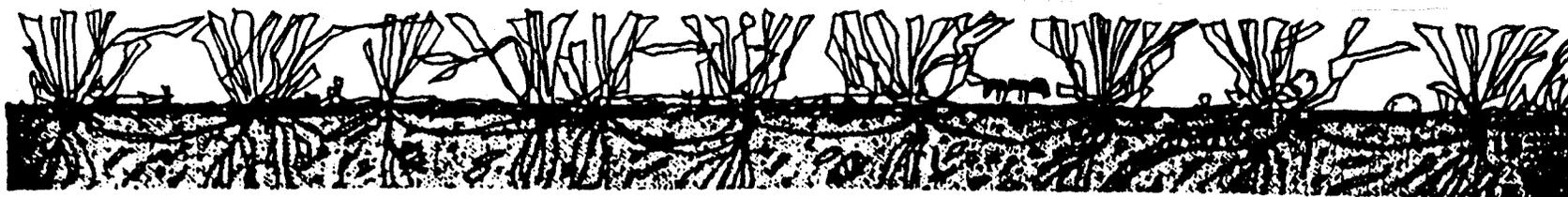
When Spraying, Protect



Wash this clothing separately
before using it again.

Before Using Any Pesticide, Be Sure To Review These Basic Rules

1. **Take safety precautions. Never assume a pesticide is harmless.**
 - Read the entire label and follow its instructions. Use only the amount directed, at the time and under the conditions specified, and for the purpose listed.
 - Be sure to wear any protective clothing—like gloves, long sleeves, and long pants—indicated on the label. Wash this clothing separately before using it again.
 - Keep children and pets away from pesticides, and make sure no one goes on a treated lawn for at least the time prescribed by the pesticide label.
 - Remember to follow any state or local requirements for posting your treated lawn or notifying your neighbors that a pesticide has been applied.
 - Store and dispose of pesticides properly, according to the label directions and any state and local regulations.



often reduces pesticide use by combining it with other, non-chemical methods of pest control?

A. More and more lawn companies are offering integrated pest management (IPM) in response to public concern about pesticides. Be aware that IPM is a general term and that companies may use it to describe a wide range of activities. Find out exactly what a company means if it says it uses IPM.

Q. Is the company willing to help you understand your lawn's problems and the solutions?

A. Lawn services generally apply fertilizers and pesticides. But you may be the one who mows and waters—and poor watering and mowing practices can lead to disappointing results. The



Choosing A Lawn Care Service

Many people choose to hire a professional company to help maintain their lawn. Lawn care companies offer a range of services, from fertilizing and pest control to aerating, mowing, and renovation.

Lawn care companies should follow the same healthy lawn program outlined in this brochure. They should also follow the same precautions for minimizing pesticide risks.

How can you be sure that a service will do these things? Start by asking questions like these:

Q. Is the company licensed?

A. Nearly all states require lawn care companies to be licensed. The qualifications for obtaining a license vary from state to state, but having a license is one indication that the company is reputable and operating legally.

Q. Does the company have a good track record?

A. Ask neighbors and friends who have dealt with the company if they were satisfied with the service they received. Call the Better Business Bureau or the state or local consumer protection office listed in your phone

book; have they received any complaints about the company? Determine from the state pesticide regulatory agency if the company has a history of violations.

Q. Is the company affiliated with a professional lawn care association?

A. Affiliation with a professional association helps members to stay informed of new developments in the lawn care field.

Q. Does the company offer a variety of pest management approaches? Does it apply pesticides on a set schedule or only when they are really needed? Does it use integrated pest management, or "IPM"—an approach that



For More Information

Affiliated with the Land Grant university in each state is a system of **County Cooperative Extension Offices**. Usually listed in the telephone directory under county or state government, these offices often have a range of resources on lawn care and landscape maintenance, including plant selection, pest control, and soil testing.

State agriculture and/or environmental agencies may publish information on pests and pest management strategies. The state pesticide regulatory agency can provide information on pesticide regulations, and may also have information on companies with a history of complaints or violations. NPTN (see below) can identify the agency responsible for pesticide regulation in each state.

The **National Pesticide Telecommunications Network** is a toll-free, 24-hour information service that can be reached by calling 1-800-858-7378 or by FAX at 806-743-3094. The operators can provide a wide range of information about the health effects of pesticides, and provide assistance in dealing with pesticide-related emergencies.

Libraries, bookstores, and garden centers usually have a wide selection of books that discuss lawn care and other aspects of landscape management. Garden centers may also have telephone hotlines or experts available on the premises to answer your gardening questions.

The **Environmental Protection Agency** can provide information on integrated pest management strategies for lawn care. Write EPA's

Office of Pesticide Programs, Field Operations Division (H7506C), 401 M St., S.W., Washington, D.C. 20460.

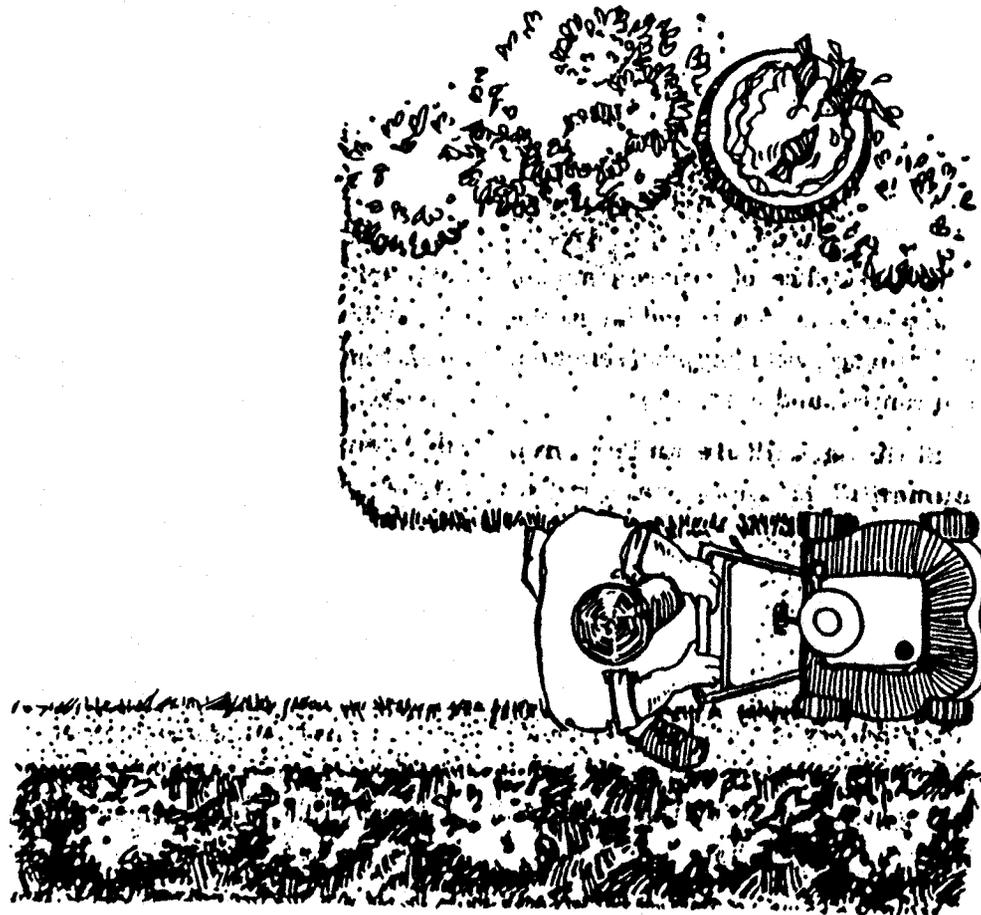
Some **suppliers of lawn care products** can provide helpful tips, answer questions, and help identify problems. Look for information/hotline numbers on product packaging.

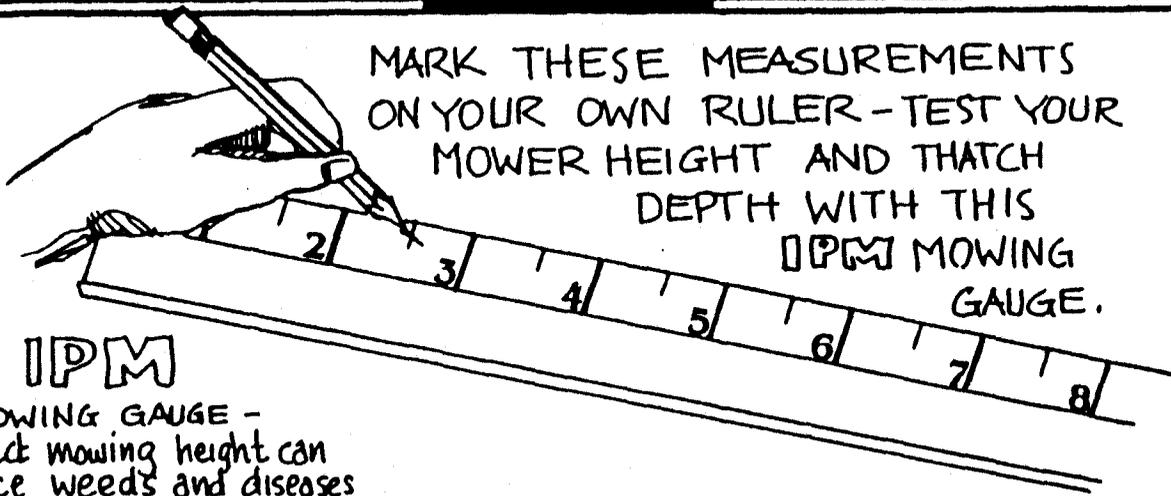
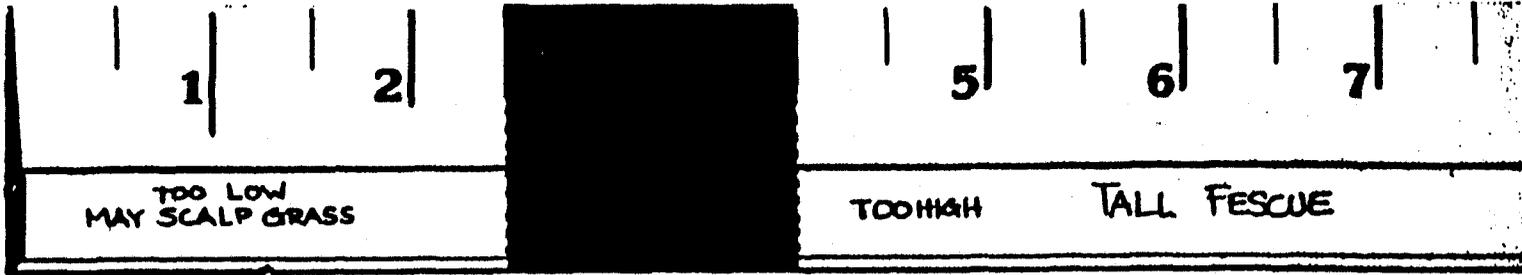
The **Bio-Integral Resource Center (BIRC)**, a non-profit organization formed in 1978 through an EPA grant, has information on *least-toxic methods for lawn care*. BIRC's address is: P.O. Box 7414, Berkeley, CA 94707.

company should tell you how it plans to take care of your lawn, and advise you about the work you need to do to keep your lawn in good shape.

Q. Will the company tell you what pesticides it applies to your lawn and why, and what health and environmental risks may be presented by their use?

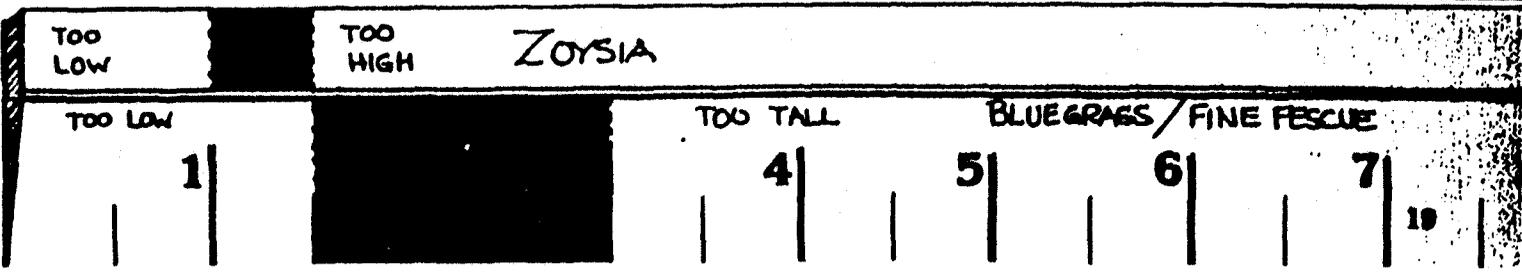
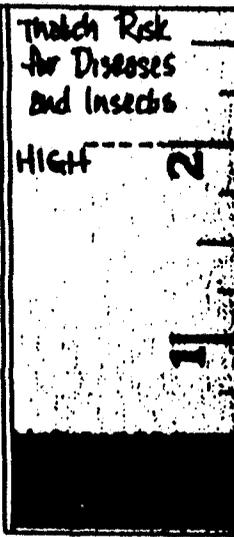
A. You have a right to this information. If asked, the company should readily supply it. All pesticides sold legally in the United States are registered by EPA, but such registration is not a guarantee of safety. Ask to see a copy of pesticide labels to make sure they bear an EPA registration number, and to review the directions that should be followed. If the company can't answer your questions about the chemicals it uses, call NPTN (1-800-858-7378) for more information.





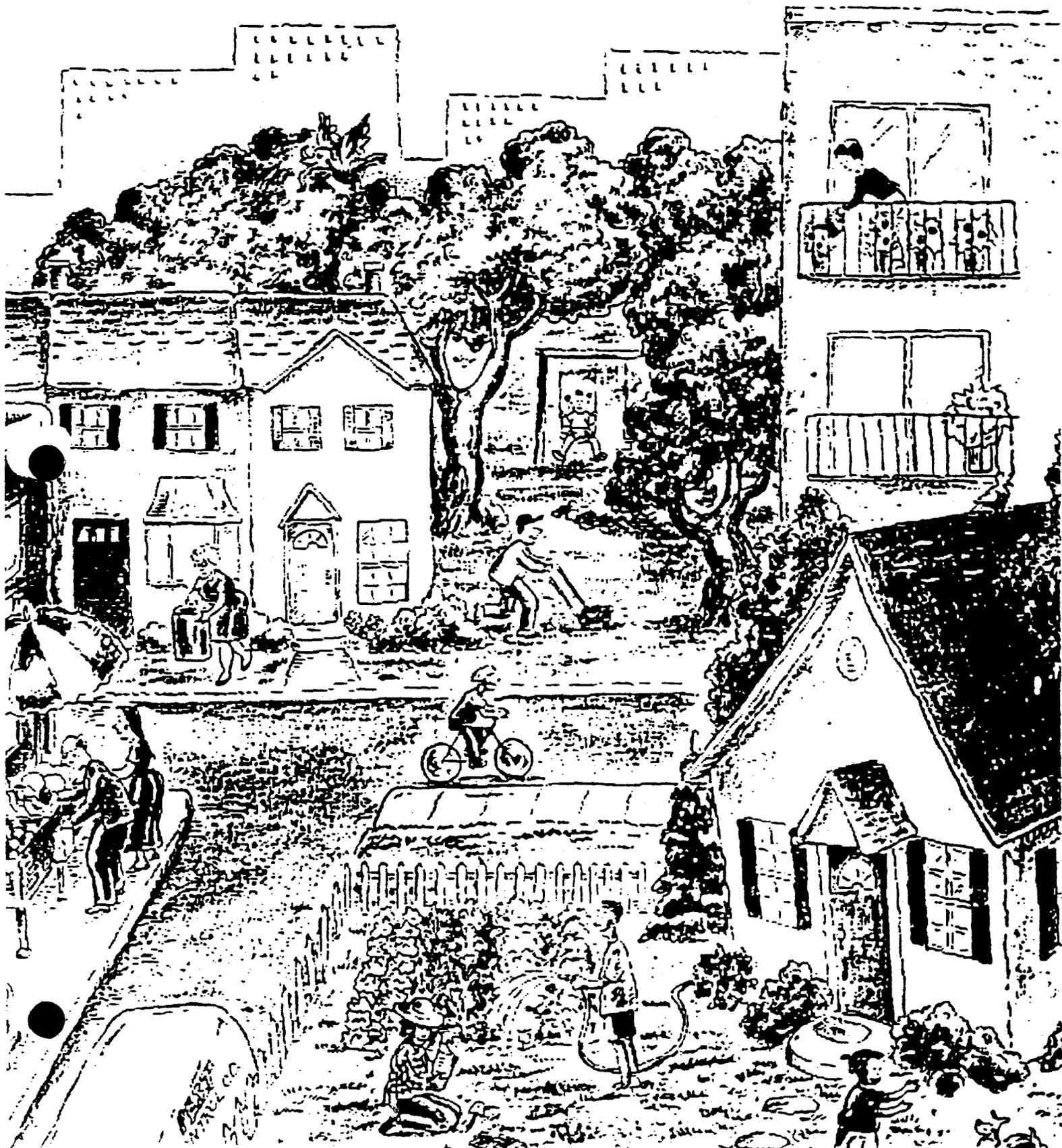
IPM

-MOWING GAUGE -
correct mowing height can
reduce weeds and diseases
by 50 to 80%.





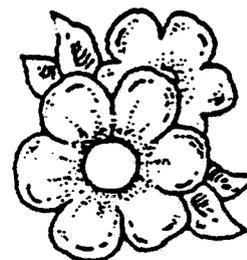
Citizen's Guide to Pest Control and Pesticide Safety



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Foreword

The Environmental Protection Agency (EPA) is charged with ensuring that pesticides do not pose unreasonable risks to the public and to the environment. EPA regulates the use of pesticides under the authority of two laws—the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug and Cosmetic Act (FFDCA). Most all pesticides may legally be sold in the United States if they have been “registered” by EPA and if they bear an EPA registration number. Federal pesticide registration, however, is only the first step in preventing pesticide risks. Just as important are the steps that consumers take to control pests and use pesticides safely. EPA hopes that this booklet will help you control pests safely.

Introduction

 **SOONER OR LATER**, we're all pestered by pests. Whether it's ants in the kitchen or weeds in the vegetable garden, pests can be annoying and bothersome. At the same time, many of us are concerned that the pesticides we use to control pests can cause problems too. How can pests be controlled safely? When and how should pesticides be used?

This booklet is intended to help answer these questions. The questions have no single right answer, but *Citizen's Guide to Pest Control and Pesticide Safety* gives the information you need to make informed decisions. You should be able to control pests without risking your family's health and without harming the environment.

The major goals of this booklet are to help you understand—

- ◆ What steps to take to control pests in and around your home.
- ◆ What alternatives to chemical pesticides are available, including pest prevention and non-chemical pest controls.

Did you know that these common household products are pesticides?

- 
- ✓ Cockroach sprays and baits.
 - ✓ Insect sprays and wasp repellents for indoor use.
 - ✓ Insect repellents for personal use.
 - ✓ Termite control products.
 - ✓ Rat and other rodent poisons.
 - ✓ Flea and tick sprays, powders, and pet collars.
 - ✓ Kitchen, laundry, and bath disinfectants and sanitizers, including bleach.
 - ✓ Products to kill mold and mildew.
 - ✓ Lawn and garden products such as weed killers.
 - ✓ Swimming pool chemicals, including those that kill algae.
 - ✓ Repellents that keep deer, raccoons, or rabbits away from your garden.
- 

- ◆ How to choose pesticides and how to use, store, and dispose of them safely.
- ◆ How to reduce your exposure when others use pesticides.
- ◆ How to choose a pest control company.
- ◆ What to do if someone is poisoned by a pesticide.

Pests, Pest Control, and Pesticides

 **PLANTS**, insects, mold, mildew, rodents, bacteria, and other organisms are a natural part of the environment. They can benefit people in many ways. But they can also be pests. Apartments and houses are often hosts to common pests such as cockroaches, fleas, termites, ants, mice, rats, mold, or mildew. Weeds, hornworms, aphids, and grubs can be a nuisance outdoors when they get into your lawn, flowers, yard, vegetable garden, or fruit and shade trees. Pests can also be a health hazard to you, your family, and your pets. It's easy to understand why you may need and want to control them.

Nowadays, you can choose from many different methods as you plan your strategy for controlling pests. Sometimes a non-chemical method of control is as effective and convenient as a chemical alternative. For many pests, total elimination is almost impossible, but it is possible to control them. Knowing your options is the key to pest control. Methods available to you include pest prevention, non-chemical pest controls, and chemical pesticides. Each of these methods will be described in more detail in the next three sections of this booklet (starting on pages 6, 11, and 13).

Pest Management

The most effective strategy for controlling pests may be to combine methods in an approach known as integrated pest management (IPM) that emphasizes preventing pest damage. In IPM, information about pests and available pest control methods is used to manage pest damage by the most economical means and with the least possible hazard to people, property, and the environment. An example of using the IPM approach for lawn care is presented in the next section of this booklet titled "Preventing Pests."



Some signs of pest infestation are unmistakable.

Knowing a range of pest control methods gives you the ability to choose among them for an effective treatment. Knowing the options also gives you the choice of limiting your exposure to potentially harmful chemicals. No matter what option you choose, you should follow these steps to control your pest problem:

First Steps in Pest Management

1 Identify the pest problem. This is the first and most important step in pest control—figuring out exactly what you're up against. Some pests (or signs of them) are unmistakable—most people recognize a cockroach or a mouse. Other signs that make you think "pest" can be misleading. For example, what may look like a plant "disease" may be, in fact, a sign of poor soil or lack of water.

Use free sources to help identify your pest and to learn the most effective methods to control it. These sources include library reference books (such as insect field guides or gardening books) and pest specialists at your County Cooperative Extension Service or local plant nurseries. These resources are usually listed in the telephone book.

2 Decide how much pest control is necessary. Pest control is not the same as pest elimination. Insisting on getting rid of all pests inside and outside your home will lead you to make more extensive, repeated, and possibly hazardous chemical treatments than are necessary. Be reasonable. Ask yourself these questions:

- ◆ Does your lawn really need to be totally weed free?
- ◆ Recognizing that some insects are beneficial to your lawn, do you need to get rid of all of them?
- ◆ Do you need every type of fruit, vegetable, or flower you grow, or could you replace ones that are sensitive to pests with hardier substitutes?
- ◆ Can you tolerate some blemished fruits and vegetables from your garden?
- ◆ Is anyone in your home known to be particularly sensitive to chemicals?

Preventing Pests

PESTS SEEK PLACES TO LIVE that satisfy basic needs for air, moisture, food, and shelter. The best way to control pests is to try to prevent them from entering your home or garden in the first place. You can do this by removing the elements that they need to survive. Take the following preventive actions:

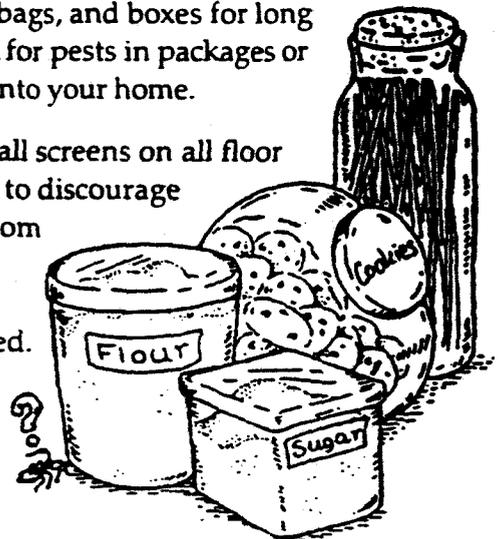
Indoor Prevention

◆ **Remove water.** All living things, including pests, need water for survival. Fix leaky plumbing, and do not let water accumulate anywhere in or around your home. For example, do not leave any water in trays under your houseplants, under your refrigerator, or in buckets overnight. Remove or dry out water-damaged and wet materials. Even dampness or high humidity can attract pests.

◆ **Remove food.** Store your food in sealed glass or plastic containers, and keep your kitchen clean and free from cooking grease and oil. Do not leave food in pet bowls on the counter or floor for long periods of time. Put food scraps or refuse in tightly covered, animal-proof garbage cans, and empty your garbage frequently.

◆ **Remove or block off indoor pest hiding places.** Caulk cracks and crevices to control pest access. Bathe pets regularly and wash any mats or surfaces they lie on to control fleas. Avoid storing newspapers, paper bags, and boxes for long periods of time. Also, check for pests in packages or boxes before carrying them into your home.

◆ **Block pest entryways.** Install screens on all floor drains, windows, and doors to discourage crawling and flying pests from entering your home. Make sure any passageways through the floor are blocked. Place weatherstripping on doors and windows. Caulk and seal openings in walls. Keep doors shut when not in use.



Store food in sealed containers.



Pests need water to survive. Fix leaky pipes.

Outdoor Prevention

- ◆ **Remove or destroy outdoor pest hiding places.** Remove piles of wood from under or around your home to avoid attracting termites and carpenter ants. Destroy diseased plants, tree prunings, and fallen fruit that may harbor pests. Rake fallen leaves. Keep vegetation, shrubs, and wood mulch at least 18 inches away from your house.
- ◆ **Remove breeding sites.** Clean up pet droppings from your yard; they attract flies that can spread bacteria. Do not accumulate litter or garbage; it draws mice, rats, and other rodents. Drain off or sweep away standing puddles of water; water is a breeding place for mosquitos and other pests. Make sure drain pipes and other water sources drain away from your house.
- ◆ **Take proper care of all outdoor plants.** These include flowers, fruit and shade trees, vegetable and other plants, and your lawn. Good plant health care reduces pest control needs—healthy plants resist pests better than do weak plants. Plant at the best time of year to promote healthy growth. Use mulch to reduce weeds and maintain even soil temperature and moisture. Water adequately. Native flowers, shrubs, and trees often are good choices because they adapt well to local conditions and require minimal care.



Remove breeding sites.
Clean up litter or garbage.

Gardening

- ◆ **Select healthy seeds and seedlings that are known to resist diseases and are suited to the climate where you live.** Strong seeds are likely to produce mature plants with little need for pesticides.
- ◆ **If your garden is large, alternate rows of different kinds of plants.** Pests that prefer one type of vegetable (carrots, for example) may not spread to every one of your carrot plants if other vegetables (not on the pests' diet) are planted in the neighboring rows.
- ◆ **Don't plant the same crop in the same spot year after year.** That way your plants are not as vulnerable to pests that survive the winter.
- ◆ **Make sure your garden plot has good drainage.** Raised beds will improve drainage, especially of clay soils. If a heavy clay soil becomes compacted, it does not allow air and water to get to the roots easily, and plants struggle to grow. To loosen



Before planting, add organic matter to enrich the soil mixture in your garden plot.

compacted soil and create air spaces so that water and nutrients can reach the roots, buy or rent a tiller that breaks up the dirt and turns it over. Before planting, add sand and organic matter to enrich the soil mixture in your garden plot. Also, have the soil tested periodically to see whether you need to add more organic matter or adjust the pH (acidity/alkalinity) balance by adding lime or sulfur. Your County Cooperative Extension Service, listed in the telephone book, or local nursery should be able to tell you how to do this.

- ◆ Mulch your garden with leaves, hay, grass clippings, shredded/chipped bark, or seaweed. Do not use newspapers to keep down weeds or to fertilize plants. Newsprint may contain toxic metals such as lead and mercury.

Lawn Care

Tending a garden may not be your hobby; but if you rent or own a home, you might need to care for the lawn. You don't have to be an expert to grow a healthy lawn—the key is to work with nature. You need to create the right conditions for your grass to grow strong and stay healthy. A healthy lawn can resist damage from weeds, disease, and insect pests. Set realistic weed and pest control goals for your lawn.

Think of lawn care as a preventive health care program, like one you would follow to stay healthy yourself. The goal is to prevent problems from ever occurring.

Pesticides can be effective, but should not be relied on as the quick-fix solution to any lawn problem. Serious, ongoing pest problems are often a sign that your lawn is not getting what it needs to stay healthy. Pests may be a symptom of an underlying problem. You need to correct the underlying problem to reduce the chances of pests reappearing.

Make these six steps part of a preventive health care program for your lawn:

- 1** Develop healthy soil that has the right pH balance, key nutrients, and good texture. You can buy easy-to-use soil analysis kits at hardware stores or contact your local County Cooperative Extension Service for a soil analysis.
- 2** Choose a type of grass that grows well in your climate. For instance, if your area gets very little rain, don't plant a type of grass that needs a lot of water. Your local County Cooperative Extension Service can advise you on which grasses grow best in your area.
- 3** Mow high, mow often, and make sure the lawn mower blades are sharp. Grass that is slightly long makes a strong, healthy lawn with few pest problems. Weeds have a hard time taking root and growing when grass is fairly long (around $2\frac{1}{2}$ to $3\frac{1}{2}$ inches for most types of grass). A foot-high meadow isn't necessary; just adding an inch to the length of your grass will give most lawns a real boost.
- 4** Water deeply but not too often. The best rule is to water only when the lawn begins to wilt from dryness—when the color dulls and footprints stay in the grass for more than a few seconds. Avoid watering during the hottest part of the day because the water will evaporate too quickly.
- 5** Correct thatch buildup. Thatch is a layer of dead plant material between the grass blades and the soil. When thatch gets too thick (deeper than $\frac{1}{4}$ of an inch), it prevents water and nutrients from getting into the soil and reaching the roots of the grass. Overusing synthetic fertilizer can create a heavy layer of thatch, and some kinds of grass are prone to thatch buildup.



Get rid of excess thatch by raking the lawn or using a dethatching rake.

In a healthy lawn, earthworms, spiders, millipedes, and a variety of microorganisms help keep the thatch layer in balance by breaking it up and using it for food, which releases nutrients into the soil. You can get rid of excess thatch by raking the lawn using a dethatching rake or by using a machine that pulls plugs out of the grass and thatch layer to break it up. Sprinkle a thin layer of topsoil or compost over the lawn after dethatching or aerating it to speed up the process of decomposition.

6 Set realistic weed and pest control goals. It is almost impossible to get rid of all weeds and pests. However, even a lawn that is 15 percent weeds can look almost weed-free to the casual observer. A healthy lawn will probably always have some weeds and some insect pests. But a healthy lawn will also have beneficial insects and other organisms like earthworms that keep pests under control. Improper use of pesticides can kill these beneficial organisms.

By following this preventive health care program for your lawn, you should be able to rely very little, if at all, on chemical pesticides for weed and insect pest control. For additional information, refer to EPA's booklet *Healthy Lawn, Healthy Environment*. (See page 42 in the Reference Section.)



If you use the preventive techniques just described, you reduce the chance of pests ever getting into your home or garden in the first place.



Using Non-Chemical Pest Controls

YOU'VE GOT PESTS, and you want to control them with a dependable pest control method that does not contain chemical pesticides. Non-chemical pest control methods really work, and they have many advantages. Compared to chemical treatments, non-chemical methods are generally effective for longer periods of time. They are less likely to create hardy pest populations that develop the ability to resist pesticides. And many non-chemical pest controls can be used with fewer safeguards, because they are generally thought to pose virtually no hazards to human health or the environment. Two examples of non-chemical pest control methods are biological and manual treatments.

Biological Controls

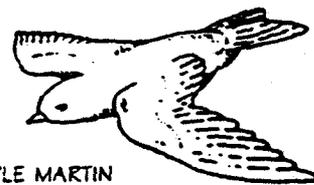
Did you know that pests themselves may be eaten or otherwise controlled by birds, insects, or other living organisms? You can use a pest's natural enemies (predators) to your advantage. These "biological controls," as they are called, take many forms:

- ◆ **Beneficial predators** such as purple martins and other birds eat insects; bats can eat thousands of insects in one night; lady beetles (ladybugs) and their larvae eat aphids, mealybugs, whiteflies, and mites. Other beneficial bugs include spiders, centipedes, ground beetles, lacewings, dragonflies, big-eyed bugs, and ants. You can install a purple martin house in your yard. You can also buy and release predatory insects. They are available from sources such as gardening catalogs and magazines.

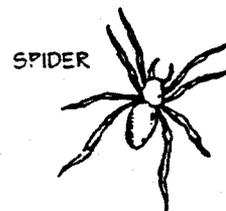
Contact your County Cooperative Extension Service, a nursery, or a garden association for information on how to attract and protect beneficial predators.

- ◆ **Parasitoids** such as miniature wasps lay their eggs inside the eggs or bodies of insect pests such as tomato hornworms. Once the eggs hatch, the offspring kill their insect hosts, making parasitoids highly effective pest controllers.

Beneficial Predators



PURPLE MARTIN



SPIDER



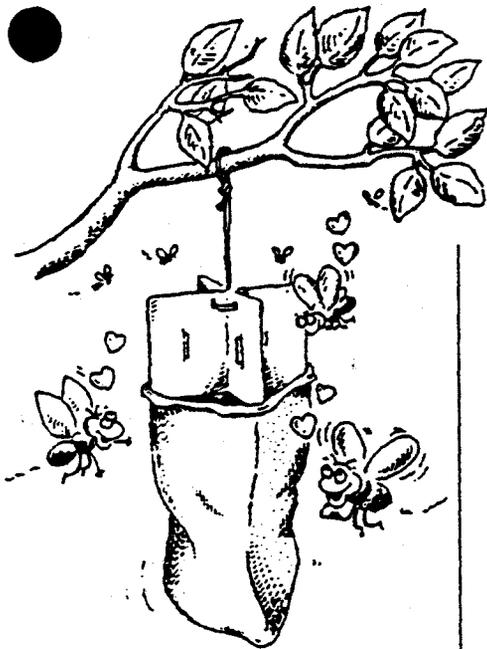
LADYBUG



CENTIPEDE

MINI-WASP





Pheromone traps lure pests.

- ◆ **Microscopic pathogens** such as fungi, bacteria, and viruses control pests. An example is milky spore disease, which attacks Japanese beetles. A number of these biological pesticides are available commercially at hardware and garden stores. (See page 43 in the Reference Section for more information.)
- ◆ **Biochemical pesticides** include pheromones and juvenile insect hormones. Pheromones are chemical substances released by various organisms (including insects) as means of communicating with others of the same species, usually as an aid to mating. Pheromones lure pests inside a trap. Juvenile insect hormones interfere with an insect's normal growth and reproductive functions by mimicking the effects of compounds that occur naturally in the pest.

Manual Methods

- ◆ Spading and hoeing to cut up weeds.
- ◆ Hand-picking weeds from your lawn and pests from your plants, indoors or out.
- ◆ Using a flyswatter.
- ◆ Setting traps to control rats, mice, and some insects.
- ◆ Mulching to reduce weed growth.

One or a combination of several non-chemical treatments may be just what you need for your pest problem. You must be patient because results may not be immediate. And, you must work to prevent pests from entering your home or garden in the first place.

Using Chemical Pest Controls

 **IF YOU DECIDE** that the best solution to your pest problem is chemical—by itself or, preferably, combined with non-chemical treatments—be aware that one of the greatest causes of pesticide exposure to humans is the use of pesticides in and around the home.

Anyone can buy a wide variety of “off the shelf” pesticide products to control weeds, unwanted insects, and other pests. No special training is required to use these pesticides. Yet many of the products can be hazardous to people, especially when stored, handled, applied, or disposed of improperly. The results achieved by using chemical pesticides are generally temporary, and repeated treatments may be required. Over time, some pests become pesticide-resistant, meaning they adapt to the chemical and are no longer harmed by it. This forces you to choose another product or method. If used incorrectly, home-use pesticide products can be poisonous to humans. As a result, it is extremely important for you to take responsibility for making sure that these products are used properly. The basic steps in reducing pesticide risks are—

- ◆ Choosing the right pesticide product.
- ◆ Reading the product label.
- ◆ Determining the right amount to purchase and use.
- ◆ Using the product safely and correctly.
- ◆ Storing and disposing of pesticides properly.

Each of these steps is described in more detail in the sections that follow.



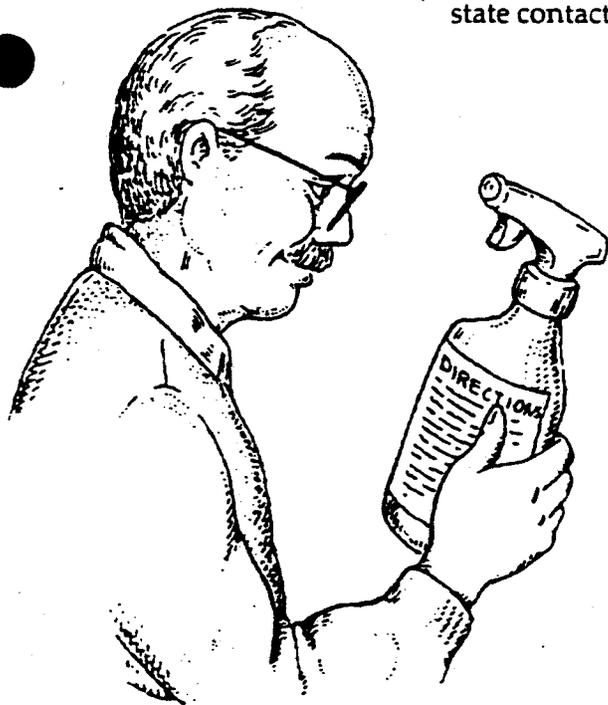
Choosing the right product is a basic step in reducing pesticide risks.

Choosing the Right Pesticide Product

Once you decide to use chemical pesticides, you must decide whether to do the job yourself or hire a professional pest control service. If you are interested in hiring professionals, see pages 36–38 for advice. If you choose to tackle the job yourself, the next question is the most important. Which pesticide product is the best one for your situation?

Home-use pesticides come in many forms—including solutions, aerosols, dusts, granules, baits, and wettable powders. As the name implies, wettable powders are usually mixed with water and/or other liquids and then applied. Pesticide solutions are often diluted with water. Certain formulations work better for some pests and/or some target areas than others. Many pesticides also come in ready-to-use forms, such as aerosols and spray bottles, which are often more practical and easy to use because they don't require measuring or mixing.

Before you buy a product, read the label! Compare product labels, and learn as much as you can about the pesticide. Contact your County Cooperative Extension Service (listed in the telephone book), local pesticide dealers, the National Pesticide Telecommunications Network (NPTN) at 1-800-858-7378, or your state pesticide agency for assistance. (See pages 45–48 in the Reference Section for state contacts.)



Read the label before you buy or use a pesticide product.

When you are ready to buy a pesticide product, follow these recommendations:

- ◆ First, be certain that you have identified the problem correctly. Then, choose the least toxic pesticide that will achieve the results you want and be the least toxic to you and the environment.
- ◆ When the words "broad-spectrum" appear on the label, this means the product is effective against a broad range of pests. If the label says "selective," the product is effective against one or a few pests.
- ◆ Find the signal word—either *Danger-Poison*, *Danger*, *Warning*, or *Caution* on the pesticide label. The signal word tells you how poisonous the product is to humans. (See page 16.)

Pesticide products labeled *Danger-Poison* are "Restricted Use" and are mainly used under the supervision of a certified applicator. For the most part, these products should not be available for sale to the consumer.

- ◆ Choose the form of pesticide (aerosol, dust, bait, or other) best suited to your target site and the pest you want to control.

DANGER-POISON means highly poisonous.

DANGER means poisonous or corrosive.

WARNING means moderately hazardous.

CAUTION means least hazardous.



Choose the form of pesticide best suited to your target site and the pest you want to control.



Reading the Pesticide Label

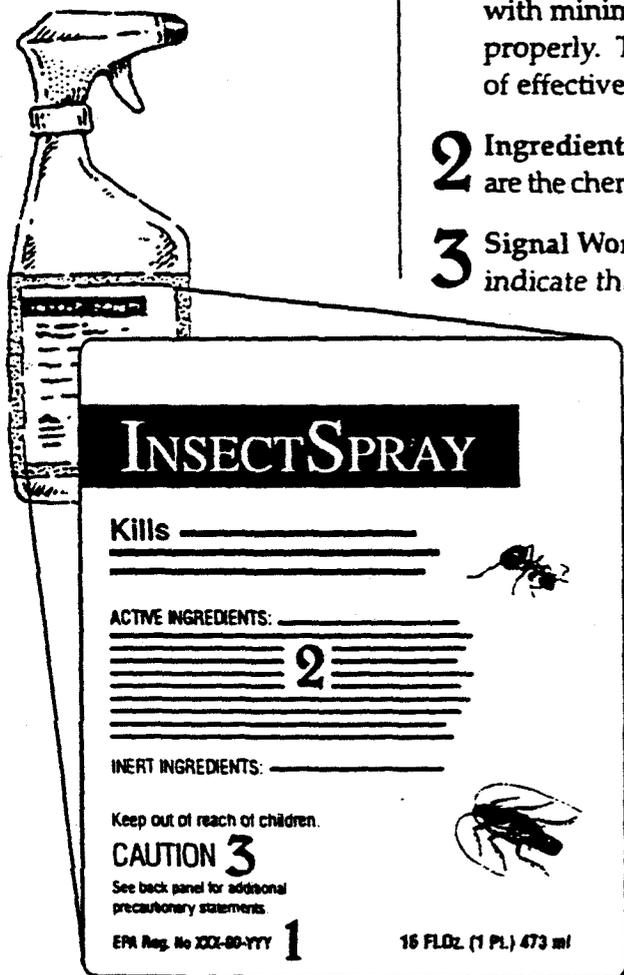
The pesticide label is your best guide to using pesticides safely and effectively. The directions on the label are there primarily to help you achieve "maximum" benefits—the pest control that you desire—with "minimum" risk. Both depend on following label directions and correctly using the pesticide. *Read the label.* Read the label *before buying* the pesticide. Read the label *before mixing or using* the pesticide *each time*, and read the label before storing or disposing of the pesticide. Do not trust your memory. You may have forgotten part of the label instructions or they may have changed. Use of any pesticide in any way that is not consistent with label directions and precautions is illegal. It may also be ineffective and, even worse, dangerous.

The main sections of a pesticide label are described below:

1 EPA Registration Number. This number tells you that EPA has reviewed the product and determined that it can be used with minimal or low risk if you follow the directions on the label properly. The number is not a stamp of approval or guarantee of effectiveness.

2 Ingredients Statement or Active Ingredients. Active ingredients are the chemicals in the pesticide that kill or control the target pest(s).

3 Signal Words. The signal words—*Caution, Warning, or Danger*—indicate the pesticide's potential for making you sick. The word **CAUTION** appears on pesticides that are the least harmful to you. A pesticide with the word **WARNING** is more poisonous than those with a *Caution* label. Pesticides with the word **DANGER** on the label are very poisonous or irritating. They should be used with extreme care because they can severely burn your skin and eyes.



Main sections on front label.

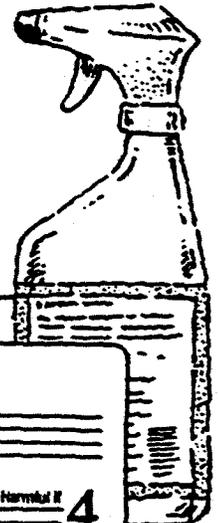
4 **Precautionary Statements.** This part describes the protective clothing, such as gloves or goggles, that you should wear when using the pesticide. The section also tells you how to protect children or pets by keeping them away from areas treated with pesticides.

5 **Environmental Hazards.** This section tells you if the product can cause environmental damage—if it's harmful to wildlife, fish, endangered plants or animals, wetlands, or water.

6 **Directions for Use.** Make sure that the product is labeled for use against the pest(s) that you are trying to control. (For example, products labeled only for termites should not be used to control fleas.) Use only the amounts recommended, and follow the directions exactly.

7 **First Aid Instructions.** The label tells you what to do if someone is accidentally poisoned by the pesticide. Look for this information in the *Statement of Practical Treatment* section. The instructions are only first aid. **ALWAYS** call a doctor or your local poison control center. You may have to take the person to a hospital right away after giving first aid. Remember to take the pesticide label or container with you.

8 **Storage and Disposal.** Read carefully and follow all directions for safe storage and disposal of pesticide products. Always keep products in the original container and out of reach of children, in a locked cabinet or locked garden shed.



INSECTSPRAY

InsectSpray contains _____

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS—CAUTION: Harmful if _____ **4**

STATEMENT OF PRACTICAL TREATMENT (First Aid): _____ **7**

ENVIRONMENTAL HAZARDS: _____ **5**

PHYSICAL OR CHEMICAL HAZARDS: Keep away from _____

DIRECTIONS FOR USE: It is a violation of Federal law to use this product in a manner inconsistent with its labeling. _____ **6**

FOR USE ON: _____

KILLS: _____

STORAGE AND DISPOSAL: _____

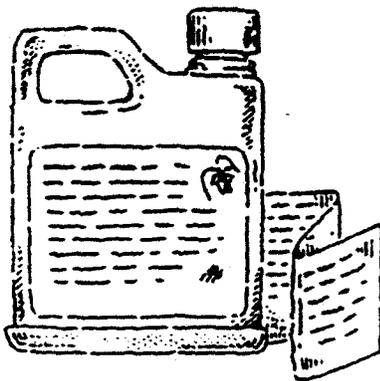
Storage: _____ **8**

Disposal: _____

EPA Reg. No XXX-00-YYY
Distributed by INSECTSPRAY, INC.



Main sections on back label.



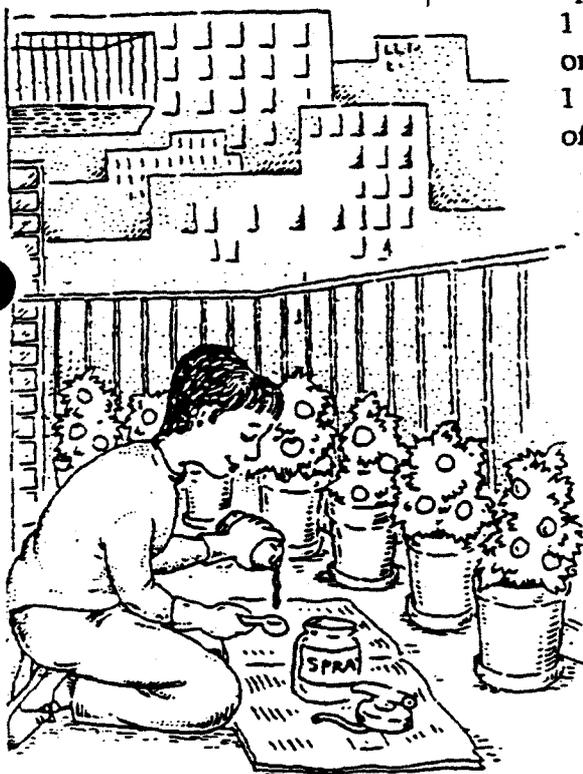
Some pesticides have small foldout booklets containing the label information.

Determining the Correct Amount To Use

Many products can be bought in a convenient ready-to-use form, such as in spray cans or spray bottles, that won't require any mixing. However, if you buy a product that has to be measured out or mixed with water, prepare only the amount of pesticide that you need for the area where you plan to use the pesticide (target area). The label on a pesticide product contains much useful information, but there isn't always room to include examples of different dilutions for every home use. Thus, it is important to know how to measure volume and figure out the exact size of the area where you want to apply the pesticide. Determining the correct amount for your immediate use requires some careful calculations. Use the following example as an illustration of how to prepare only the amount of pesticide needed for your immediate pest control problem.

An example: The product label says, "For the control of aphids on tomatoes, mix 8 fluid ounces of pesticide into 1 gallon of water and spray until foliage is wet." You have only 6 tomato plants. From experience, you know that 1 gallon is too much, and that you really need only 1 quart of water to wet the leaves on these 6 plants. A quart is only $\frac{1}{4}$ of a gallon. Because you want to use less water than the label says, you need less pesticide. You need only $\frac{1}{4}$ of the pesticide amount listed on the label—only 2 fluid ounces. This makes the same strength spray recommended by the label, and is the appropriate amount for the 6 tomato plants.

In short, all you need to do is figure the amount of pesticide you need for the size of your target area, using good measurements and careful arithmetic. For help in making these calculations, see pages 39–41 in the Reference Section.



When using pesticides that must be mixed, determine the correct amount for your immediate use.

Caution: When you use cups, teaspoons, or tablespoons to measure pesticides, use only level measures or level spoonfuls. NEVER use the same tools that you use for measuring pesticides—spoons, cups, bottles—to prepare food, even if you've washed them.

Using Pesticides Safely and Correctly

Once you have read the pesticide label and are familiar with all precautions, including first aid instructions, follow these recommendations to reduce your risks:

Before Using a Pesticide

- ◆ Wear the items of protective clothing the label requires: for example, long-sleeved shirts, long pants, overalls, non-absorbent gloves (not leather or fabric), rubber footwear (not canvas or leather), a hat, goggles, or a dust-mist filter. If no specific clothing is listed, gloves, long-sleeved shirts and long pants, and closed shoes are recommended. You can buy protective clothing and equipment at hardware stores or building supply stores.

When Mixing or Applying a Pesticide

- ◆ Never smoke or eat while mixing or applying pesticides. You could easily carry traces of the pesticide from your hands to your mouth. Also, some pesticide products are flammable.
- ◆ Follow the use directions on the label carefully. Use only for the purpose listed. Use only the amount directed, at the time and under the conditions specified. **Don't change the recommended amount.** Don't think that twice the amount will do twice the job. It won't. You could harm yourself, others, or whatever you are trying to protect.
- ◆ If the directions on the label tell you to mix or dilute the pesticide, do so outdoors or in a well-ventilated area. Use the amount listed on the label and measure the pesticide carefully. (Never use the same measuring cups or spoons that you use in the kitchen.) Mix only the amount that you need for each application. Do not prepare larger amounts to store for possible future use. (See "Determining the Correct Amount To Use" on page 18.)



When using a pesticide—

- ✓ Read and follow the label directions.
- ✓ Wear protective clothing.
- ✓ Don't smoke or eat.
- ✓ Mix and apply only the amount you need.





Mix pesticides outdoors or in a well-ventilated area.

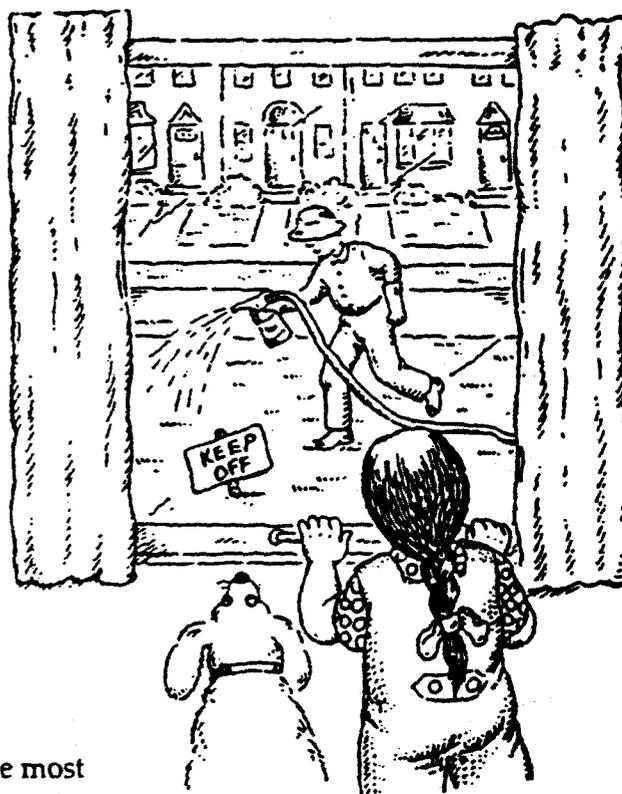
- ◆ Keep children, pets (including birds and fish), and toys (including pet toys) away from areas where you mix and apply pesticides for at least the length of time required on the label.
- ◆ Never transfer pesticides to other containers, such as empty soft drink or milk bottles. Keep pesticides in their original containers—ones that clearly identify the contents. Refasten all childproof caps tightly.
- ◆ If a spill occurs, clean it up promptly. Don't wash it away. Instead, sprinkle the spill with sawdust, vermiculite, or kitty litter. Sweep it into a plastic garbage bag, and dispose of it as directed on the pesticide product label.
- ◆ Indoors or outdoors, never put bait for insects or rats, mice, and other rodents where small children or pets can reach it. When using traps, make sure the animal inside is dead before you touch or open the trap.

Indoor Applications

- ◆ Use pesticides indoors only when absolutely necessary, and use only very limited amounts.
- ◆ Provide adequate ventilation. If the label directions permit, leave all windows open and fans operating after the application is completed. If the pesticide product is only effective in an unventilated (sealed) room or house, do not stay there. Put all pets outdoors, and take yourself and your family away from treated areas for at least the length of time prescribed on the label.
- ◆ Apply most surface sprays only to limited areas such as cracks; don't treat entire floors, walls, or ceilings.
- ◆ Remove food, pots and pans, and dishes before treating kitchen cabinets. Don't let pesticides get on any surfaces that are used for food preparation. Wait until shelves dry before refilling them. Wash any surfaces that may have pesticide residues before placing food on them.

Outdoor Applications

- ◆ Never apply pesticides outdoors on a windy day (winds higher than 10 mph). Position yourself so that a light breeze does not blow pesticide spray or dust into your face.
- ◆ Before spraying, close the doors and windows of your home.
- ◆ Use coarse droplet nozzles on your sprayer to reduce misting, and spray as close to the target as possible.
- ◆ Keep pesticides away from plants and wildlife you do not want to treat. Do not apply any pesticide to blooming plants, especially if you see honeybees or other pollinating insects around them. Do not spray bird nests when treating trees.
- ◆ Follow label directions carefully to ensure that you don't apply too much pesticide to your lawn, shrubs, or garden. Never water your lawn after applying pesticides. Before using a pesticide outdoors, check the label or contact your EPA Regional Office or County Cooperative Extension Service to find out whether the pesticide is known or suspected to run off or seep into ground water. Ground water is the underground reservoir that supplies water to wells, springs, creeks, and the like. Excessive application of pesticides could cause the pesticide to run off or seep into water supplies and contaminate them. Excess spray may also leave harmful residues on your home-grown fruit and vegetables, and could affect other plants, wildlife, and fish.
- ◆ Never mix or apply a pesticide near a wellhead.
- ◆ If you have a well, be sure it extends downward to water sources that are below, and isolated from, surface water sources. Be sure the well shaft is tightly sealed. For further information, see EPA's brochure *Pesticides in Drinking Water Wells*. (See page 42 for information on how to order a copy from EPA's Public Information Center.)
- ◆ When using total release foggers to control pests, the most important precautions you can take are to use no more than the amount needed and to keep foggers away from ignition sources (ovens, stoves, air conditioners, space heaters, and water heaters, for example). Foggers should not be used in small, enclosed places such as closets and cabinets or under tables and counters.

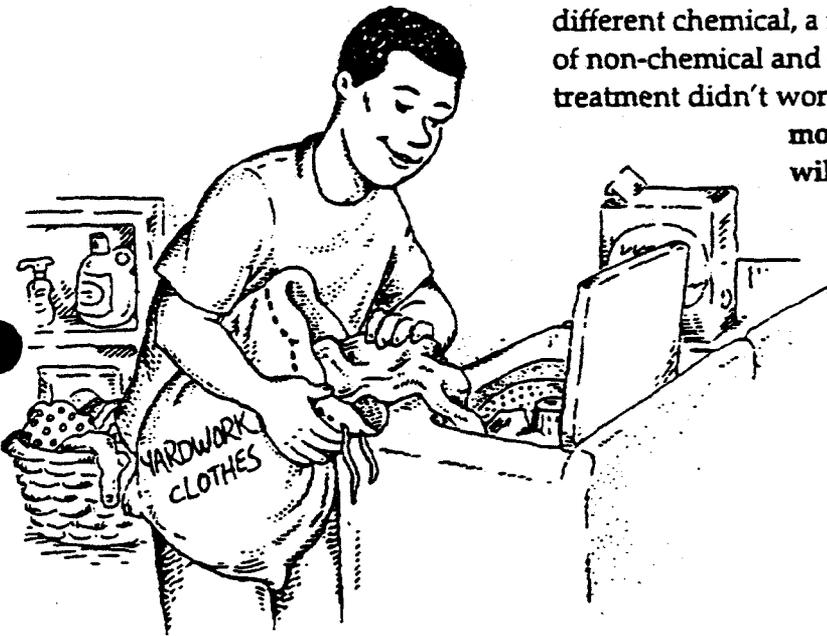


Keep children and pets away from areas where you apply pesticides.

After Applying a Pesticide, Indoors or Outdoors

- ◆ To remove pesticide residues, use a bucket to rinse tools or equipment three times, including any containers or utensils that you used when mixing the pesticide. Then pour the rinsewater into the pesticide sprayer and reuse the solution by applying it according to the pesticide product label directions. (See pages 24–25 for safe disposal guidelines.)
- ◆ Always wash your hands after applying any pesticide. Wash any other parts of your body that may have come in contact with the pesticide. To prevent tracking pesticides inside, remove or rinse your boots or shoes before entering your home. Wash any clothes that have been exposed to a lot of pesticide separately from your regular wash.
- ◆ Evaluate the results of your pesticide use. Consider using a different chemical, a non-chemical method, or a combination of non-chemical and chemical methods if the chemical treatment didn't work. Again, **do not assume that using more pesticide than the label recommends will do a better job. It won't.**

- ◆ Watch for negative effects on wildlife (birds, butterflies, and bees) in and near treated areas. If you see any unusual behavior, stop using that pesticide, and contact EPA's Pesticide Incident Response Officer (see page 35).



Wash clothing worn when using pesticides separately from other laundry.

Storing and Disposing of Pesticides Properly

Improper pesticide storage and disposal can be hazardous to human health and the environment. Follow these safety recommendations:

Safe Storage of Pesticides

- ◆ Don't stockpile. Reduce storage needs by buying only the amount of pesticide that you will need in the near future or during the current season when the pest is active.
- ◆ Follow all storage instructions on the pesticide label.
- ◆ Store pesticides high enough so that they are out of reach of children and pets. Keep all pesticides in a locked cabinet in a well-ventilated utility area or garden shed.
- ◆ Store flammable liquids outside your living area and far away from an ignition source such as a furnace, a car, an outdoor grill, or a power lawn mower.
- ◆ Never store pesticides in cabinets with or near food, animal feed, or medical supplies.
- ◆ Always store pesticides in their original containers, complete with labels that list ingredients, directions for use, and first aid steps in case of accidental poisoning.
- ◆ *Never* transfer pesticides to soft drink bottles or other containers. Children or others may mistake them for something to eat or drink.
- ◆ Use child-resistant packaging correctly—close the container tightly after using the product. Child resistant does not mean child proof, so you still must be extra careful to store properly—out of children's reach—those products that are sold in child-resistant packaging.
- ◆ Do not store pesticides in places where flooding is possible or in places where they might spill or leak into wells, drains, ground water, or surface water.
- ◆ If you can't identify the contents of the container, or if you can't tell how old the contents are, follow the advice on safe disposal in the next section.

Store pesticides in a locked cabinet out of reach of children and pets.



***Never* transfer pesticides to soft drink bottles or other containers that children or others may mistake for something to eat or drink.**



Safe Disposal of Pesticides

- ◆ The best way to dispose of small amounts of excess pesticides is to use them—apply them—according to the directions on the label. If you cannot use them, ask your neighbors whether they have a similar pest control problem and can use them.
- ◆ If all of the remaining pesticide cannot be properly used, check with your local solid waste management authority, environmental agency, or health department to find out whether your community has a household hazardous waste collection program or a similar program for getting rid of unwanted, leftover pesticides. These authorities can also inform you of any local requirements for pesticide waste disposal.
- ◆ State and local laws regarding pesticide disposal may be stricter than the Federal requirements on the label. Be sure to check with your state or local agencies before disposing of your pesticide containers.



Do not pour leftover pesticides down the sink, into the toilet, or down a sewer or street drain.

- ◆ If no community program or guidance exists, follow the label directions for disposal. In general, to dispose of less than a full container of a liquid pesticide, leave it in the original container with the cap tightly in place to prevent spills or leaks. Wrap the container in several layers of newspaper and tie it securely. Put the package in a covered trash can for routine collection with municipal trash. If you do not have a regular trash collection service, take the package to a permitted landfill (unless your town has other requirements).

Note: No more than 1 gallon of liquid pesticide at a time should be thrown out with the regular trash in this manner.

- ◆ Wrap individual packages of dry pesticides in several layers of newspaper (or place the pesticides in a tight carton or bag), and tape or tie the package closed. Put the package in a covered trash can for routine collection.

Note: No more than 5 pounds of dry pesticide at a time should be thrown out with the regular trash in this manner.

- ◆ Do not pour leftover pesticides down the sink, into the toilet, or down a sewer or street drain. Pesticides may interfere with the operation of wastewater treatment systems or pollute waterways. Many municipal systems are not equipped to remove all pesticide residues. If pesticides reach waterways, they may harm fish, plants, and other living things.
- ◆ An empty pesticide container can be as hazardous as a full one because of residues left inside. Never reuse such a container. When empty, a pesticide container should be rinsed carefully three times and the rinsewater thoroughly drained back into the sprayer or the container previously used to mix the pesticide. Use the rinsewater as a pesticide, following label directions. Replace the cap or closure securely. Dispose of the container according to label instructions. Do not puncture or burn a pressurized container like an aerosol—it could explode. Do not cut or puncture other empty pesticide containers made of metal or plastic to prevent someone from reusing them. Wrap the empty container and put it in the trash after you have rinsed it.
- ◆ Many communities have programs to recycle household waste such as empty bottles and cans. Do not recycle any pesticide containers, however, unless the label specifically states that the empty container may be recycled after cleaning.



Follow the label directions for disposal.

Reducing Your Exposure When Others Use Pesticides



EVEN IF YOU NEVER USE PESTICIDES YOURSELF, you can still be exposed to them—at home, school, work, or play—by being in treated areas, as a consumer of commodities that others have treated with pesticides, or through food, water, and air that may have been contaminated with pesticides.

This section describes sources of exposure other than your own use of pesticides. It also suggests ways to reduce your overall exposure. If you know or suspect that you, or others close to you, are sensitive to chemicals, consult an expert who can help you develop a strategy for handling your potential exposure problems.

Exposure Through Food

Commercial Food

To ensure a safe food supply, EPA regulates the safety of food by setting safety standards to limit the amount of pesticide residues that legally may remain in or on food or animal feed that is sold in the United States. Both domestic and imported foods are monitored by the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) to ensure compliance with these safety standards.

Because most crops are treated with pesticides at least some of the time, foods you buy at the grocery store may contain small traces of pesticide residues. Pesticide levels tend to decline over time because the residues break down and because crops are usually washed and processed before reaching the marketplace. So, while we all consume small amounts of pesticides regularly, levels in our food generally are well below legal limits by the time the food reaches the grocery shelves.

Although EPA sets safety standards for the amount of pesticide residues allowed both in and on foods, you can take extra precautions to reduce the traces of pesticide residues you and your family consume in the food you buy. Follow these suggestions:

- ◆ Trim the fat from meat and poultry because residues of some pesticides concentrate in fat. Remove the skin from fish.
- ◆ Discard the fats and oils in broths and pan drippings.

- ◆ **Rinse fruits and vegetables thoroughly with water. Scrub them with a brush and peel them, if possible. Taking these safety steps will remove most of the existing surface residues, along with any remaining dirt. Note that surface cleaning (rinsing and scrubbing) will not remove pesticide residues that are absorbed into the growing fruit or vegetable before harvest.**
- ◆ **Cook or bake foods to reduce residues of some pesticides even further.**



Home-Grown Food

Growing your own food can be an enjoyable activity. It is also a way to reduce your exposure to pesticide residues in food—especially if you decide not to use chemical pesticides on your produce and you choose a garden site where drift or runoff from a neighbor's use of pesticides will not result in unintended residues on your food. If your house is regularly treated for pest prevention, don't plant your garden where the treatments are applied.

Rinse fruits and vegetables with water. Scrub them with a brush and peel them, if possible.

Food from the Wild

While it may seem that hunting your own game, catching your own fish, or gathering wild plant foods would reduce your overall exposure to pesticides, that isn't necessarily true. If you eat wild animals or plants from areas where pesticides are frequently used, this food may contain pesticide residues. In addition, birds such as ducks and geese may absorb pesticide residues if they have stopped to eat treated crops anywhere along their flight path.

If you eat food from the wild, you may want to take the following steps to reduce your exposure to pesticides:

- ◆ **Do not fish in water bodies where contamination has occurred. Pay attention to posted signs that warn of contamination.**
- ◆ **Consult with fish and game officials or other appropriate officials where you plan to hunt or fish to determine whether there are any chemical problems associated with the area.**
- ◆ **Do not pick wild plants that are growing right next to a road, utility right-of-way, or hedgerow between farm fields. These areas may have been treated with pesticides.**
- ◆ **When preparing wild foods, trim fat from the meat. Discard the skin from fish.**

Exposure Through Water

When pesticides are applied to land, a certain amount may run off into streams and rivers. This runoff, together with industrial waste, may result in low-level contamination of surface water. In certain settings—for example, when sandy soil lies over a ground-water source that is near the surface—pesticides can seep down through the soil to the ground water.

To ensure a safe supply of drinking water, EPA's Office of Water sets standards for pesticides and other chemicals that may be found in drinking water. Municipal water systems test their water periodically and provide treatment or alternate supply sources if residue problems occur. Generally, private wells are not tested unless the well owner requests an analysis. If you get your drinking water from a private well—

- ◆ Contact your state or local health department if you have any questions about pesticide or other chemical residues in your well water.
- ◆ If your well water is analyzed and found to contain pesticide residue levels above established or recommended health standards, use an alternate water source such as bottled water for drinking and cooking. The safest choice is distilled spring water in glass bottles. If you buy water from a local bottler, ask for the results of any recent pesticide analysis of the bottled water.

Exposure Through Air

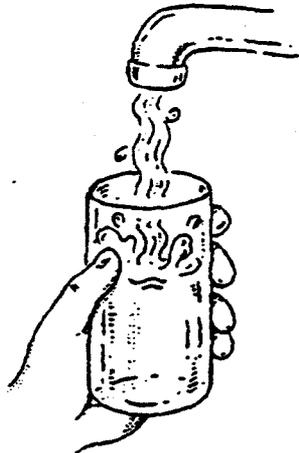
Outdoors

Air currents may carry pesticides that were applied on properties nearby. You can reduce your exposure outdoors to airborne pesticide residues, or drift, by following these recommendations:

- ◆ If a close neighbor or someone else is applying pesticides outdoors near your home, you may want to stay indoors with your children and pets. Keep windows and exterior doors closed.
- ◆ If you live near fields, parks, or other areas that receive regular pesticide treatment, consider planting a group of hardy, thick-branched trees or shrubs to help serve as a buffer zone and windbreak.



Do not fish in water bodies where contamination has occurred.



EPA sets standards for chemicals that may be found in drinking water.

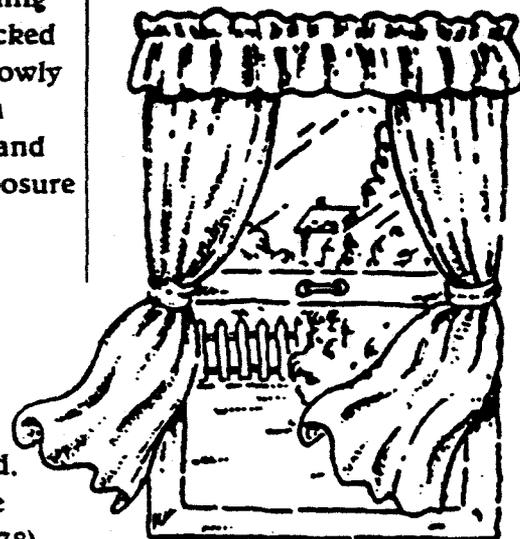
- ◆ Careless application can lead to drift or direct spraying of non-target sites. If your property is accidentally sprayed during an aerial pesticide application, you should call your local, state, or regional pesticide office. (See pages 44–48 in the Reference Section for phone numbers.) If you or someone in your family is accidentally sprayed, wash pesticide off immediately and change into clean clothes. Then call your local poison control center.

Some local governments require public notice before area-wide or broad-scale pesticide spraying activities take place. Affected residents are notified through newspaper announcements, fliers, letters, or signs posted in areas to be treated. Some communities have also enacted "right-to-know" ordinances that require public notice (usually through posting) of lawn treatments and other small-scale outdoor pesticide uses.

Indoors

The air you breathe may contain low levels of pesticide residues long after a pesticide has been applied to objects inside a building or to indoor surfaces and crawl spaces, or after it has been tracked in from outside. Pesticides break down and disappear more slowly indoors than outdoors. In addition, many homes have built-in energy efficiency features that reduce the exchange of indoor and outdoor air and thus aggravate the problem. To limit your exposure to indoor pesticide residues—

- ◆ Air out the building adequately after a pesticide is applied indoors. Open doors and windows, and run overhead, whole-house, or window fans to exchange indoor air for outdoor air rapidly and completely.
- ◆ If you suspect that the air in your building is contaminated, consult knowledgeable professionals in your local or state health department or EPA's pesticide hotline (1-800-858-7378), 6:30 a.m.–4:30 p.m. Pacific time (9:30 a.m.–7:30 p.m. Eastern time) Monday–Friday, for advice on the appropriate steps to take.



Air out the building adequately after a pesticide is applied indoors.

Poisoned by Pesticides: Don't Let This Happen to Your Child!

A 5-year-old boy drinks from a bottle of bleach that he found under the bathroom sink.

A 3-year-old girl tries to spray her hair the way mommy does, but sprays an aerosol disinfectant in her eyes instead.

A baby who has just begun to crawl eats green pebbles from behind the sofa. They look like candy, but are really rat poison.

Where do you store your pesticides?

A 1992 nationwide study conducted by EPA revealed that almost half (approximately 47 percent) of surveyed households with children under the age of 5 had at least one pesticide stored within their reach.

These accidents could happen to your children or to children visiting your home if you don't store pesticides out of their reach or if you don't read the label carefully before using the pesticide product.

The dangers are real. In 1993 alone, an estimated 80,000 children were exposed to or poisoned by a household pesticide product that was used or stored incorrectly.

Whether or not you have young children in your home, take the following precautions to protect children from unintentional pesticide poisonings or exposures:

- ◆ **Always store pesticides out of children's reach, in locked cabinet or garden shed. Installing child-proof safety latches or padlocks on cupboards and cabinets is a good idea. Safety latches are available at your local hardware store or building supply warehouse.**
- ◆ **Before applying pesticides—indoors or outdoors—remove children and their toys, along with any pets and their toys, from the area. Keep them away from the area that has been treated until the pesticide has dried and for at least the length of time recommended on the pesticide label.**
- ◆ **If you are interrupted while applying a pesticide—by a phone call, for example—be sure to close the pesticide container properly and put it out of reach of any child who may come into the area while you are gone.**

- ◆ **Never remove labels from containers, and never transfer pesticides to other containers. Children may mistake them for food or drink.**
- ◆ **Never put rodent or insect baits where small children can find them, pick them up, and put them in their mouths.**
- ◆ **Make sure you close any container marked "child resistant" very tightly after you use the product. Check periodically to make sure the product is securely closed. Child resistant does not mean child proof, so you should still be careful with products that are sold in child-resistant packaging.**
- ◆ **Make sure others—especially babysitters, grandparents, and other caregivers—know about the potential hazards of pesticides.**
- ◆ **Teach children that "pesticides are poisons"—something they should never touch or eat.**
- ◆ **Keep the telephone number of your nearest poison control center near each phone. Have the pesticide container handy when you call.**
- ◆ **Always keep Syrup of Ipecac on hand (in your medicine cabinet) to use to induce vomiting. (Be sure the date is current.) But do not give it to your child until a physician or poison control center advises you to do so. The pesticide label may not recommend using Syrup of Ipecac.**



Store pesticides out of children's reach.

Handling a Pesticide Emergency

"Help! Someone's Been Poisoned!" What To Do in a Pesticide Emergency



If the person is unconscious,
having trouble breathing,
or having convulsions . . .
ACT FAST! Speed is crucial.



Give needed first aid immediately.



Call 911 or your local emergency
service. If possible, have some-
one else call for emergency help
while you give first aid.



If the person is awake or conscious,
not having trouble breathing, and
not having convulsions . . .



Read the label for first aid
instructions.



Call a doctor, a poison control
center, a local emergency service
(911), or the National Pesticide
Telecommunications Network
(toll free at 1-800-858-7378).



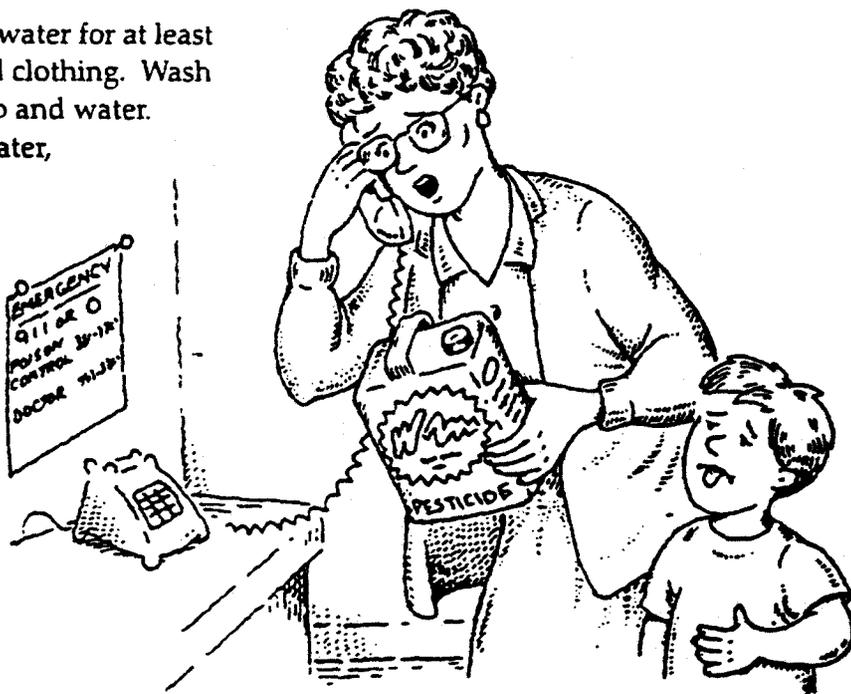
Give first aid.

First Aid for Pesticide Poisoning

When you realize a pesticide poisoning has occurred or is occurring, try to determine what the victim was exposed to and what part of the body was affected before you take action—taking the right action is as important as taking immediate action. If the person is unconscious, having trouble breathing, or having convulsions, ACT FAST! Speed is crucial. Give needed first aid immediately. Call 911 or your local emergency service. If possible, have someone else call for emergency help while you give first aid. If the person is awake or conscious, not having trouble breathing, and not having convulsions, read the label for first aid instructions. Call a doctor, a poison control center, a local emergency service (911), or the National Pesticide Telecommunications Network (toll free at 1-800-858-7378). Give first aid.

Read the *Statement of Practical Treatment* section on the product label. The appropriate first aid treatment depends on the kind of poisoning that has occurred. Follow these general guidelines:

- ◆ **Swallowed poison.** A conscious victim should drink a small amount of water to dilute the pesticide. Always keep Syrup of Ipecac on hand (in your medicine cabinet) to use to induce vomiting. Be sure the date on the bottle is current. Induce vomiting *only* if a poison control center or physician advises you to do so, or if instructions on the pesticide label say so. If there is no label available to guide you, do not induce vomiting. Never induce vomiting if the victim is unconscious or is having convulsions.
- ◆ **Poison on skin.** Drench skin with water for at least 15 minutes. Remove contaminated clothing. Wash skin and hair thoroughly with soap and water. Dry victim and wrap in blanket. Later, discard contaminated clothing or thoroughly wash it separately from other laundry.
- ◆ **Chemical burn on skin.** Drench skin with water for at least 15 minutes. Remove contaminated clothing. Cover burned area immediately with loose, clean, soft cloth. Do not apply ointments, greases, powders, or other drugs. Later, discard contaminated clothing or thoroughly wash it separately from other laundry.



If a poisoning has occurred, call for help, and be ready to read information from the pesticide label.

- ◆ **Poison in eye.** Hold eyelid open and wash eye quickly and gently with clean cool running water from the tap or a hose for 15 minutes or more. Use only water; do not use eye drops, chemicals, or drugs in the eye. Eye membranes absorb pesticides faster than any other external part of the body, and eye damage can occur in a few minutes with some types of pesticides.
- ◆ **Inhaled poison.** If the victim is outside, move or carry the victim away from the area where pesticides were recently applied. If the victim is inside, carry or move the victim to fresh air immediately. If you think you need protection like a respirator before helping the victim, call the Fire Department and wait for emergency equipment before entering the area. Loosen the victim's tight clothing. If the victim's skin is blue or the victim has stopped breathing, give artificial respiration (if you know how) and call 911 for help. Open doors and windows so no one else will be poisoned by fumes.

What To Do After First Aid

- ◆ First aid may precede but should not replace professional medical treatment. After giving first aid, call 911 or your local emergency service immediately. Have the pesticide label at hand when you call.
- ◆ Take the pesticide product container with its label to the doctor's office or emergency room where the victim will be treated. Carry the container in your trunk or flatbed away from the passengers in your vehicle. The doctor needs to know what active ingredient is in the pesticide before prescribing treatment. This information is on the label, which sometimes also includes a telephone number to call for additional treatment information.

**National Pesticide
Telecommunications Network
(NPTN)**

Call Toll Free 1-800-858-7378

Another good resource in a pesticide emergency is NPTN, the National Pesticide Telecommunications Network, a toll-free telephone service that operates Monday through Friday, from 6:30 a.m.– 4:30 p.m. Pacific time (9:30 a.m.– 7:30 p.m. Eastern time). NPTN provides information on pesticides and how to recognize and respond to pesticide poisonings. If necessary, staff at NPTN can transfer your call directly to a local poison control center. Call NPTN toll free at 1-800-858-7378.

NPTN staff answer questions about animal poisonings, too. To keep your pets from being poisoned, follow label directions on flea and tick products carefully. If you are concerned about the chemicals used in these products, consult your veterinarian.



How To Recognize Pesticide Poisoning

External irritants that contact skin may cause skin damage such as redness, itching, or pimples. External irritants may also cause an allergic skin reaction that produces redness, swelling, or blistering. The mucous membranes of the eyes, nose, mouth, and throat are also quite sensitive to chemicals. Pesticide exposure may cause stinging and swelling in these membranes.

Internal injuries also may occur if a pesticide is swallowed, inhaled, or absorbed through the skin. Symptoms vary from organ to organ. Lung injury may result in shortness of breath, drooling (heavy salivation), or rapid breathing. Direct injury to the stomach and intestines may produce nausea, vomiting, abdominal cramps, or diarrhea. Injury to the nervous system may cause excessive fatigue, sleepiness, headache, muscle twitching, and numbness. In general, different types of pesticides produce different sets of symptoms.

If someone develops symptoms after working with pesticides, seek medical help immediately to determine if the symptoms are pesticide related. In certain cases, blood or urine should be collected for analysis, or other specific exposure tests can be made. It is better to be too cautious than too late.

Avoid potential health problems by minimizing your exposure to pesticides. Follow all the safety recommendations on pages 19-25.

EPA wants to know about any adverse effects associated with pesticide exposure. If you have such information, contact—

Pesticide Incident Response Officer
Office of Pesticide Programs (7506C)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Choosing a Pest Control Company



IF YOU HAVE a pest control problem that you do not want to handle on your own, you may decide to turn to a professional applicator. How can you be sure that the pest control company you hire will do a good job? Before you choose a company, get answers to these questions:

1 Is the company licensed?

Most state or local agencies issue state pest control licenses. Make sure the pest control operator's licence is **current** if one is required in your state. Also, ask if the company's **employees are bonded**, meaning that the company reimburses you for any loss or damage caused by the employee.

You may want to contact your state pesticide agency to find out about its pesticide certification and training programs and to ask whether periodic recertification is required for pest control operators. (See pages 45–48 for addresses and phone numbers.)

In addition, possession of a city license—where they are issued—is one more assurance that the company you are dealing with is reputable and responsible.

2 Is the company willing and able to discuss the treatment proposed for your home?

Selecting a pest control service is just as important as selecting other professional services. Look for the same high degree of competence you would expect from a doctor or lawyer. Any company, including those advertising themselves as “green,” should inspect your premises and outline a recommended control program, including the—

- ◆ Pests to be controlled.
- ◆ Extent of the problem.
- ◆ Active ingredient(s) in the pesticide chosen.
- ◆ Potential adverse health effects and typical symptoms of poisoning associated with the active ingredient.
- ◆ Form of the pesticide and application techniques.
- ◆ Non-chemical alternatives available.

- ◆ Special instructions to reduce your exposure to the pesticide (such as vacating the house, emptying the cupboards, and removing pets).
- ◆ Steps to take to minimize your pest problems in the future.

3 Does the company have a good track record?

Don't rely on the company salesperson to answer this question. Research the answer yourself. Ask neighbors and friends if they have ever dealt with the company. Were they satisfied with the service they received? Call the Better Business Bureau or local consumer office and find out if they have received complaints about the company.

4 Does the company have appropriate insurance? Can the salesperson show proof on paper that the company is insured?

Most contractors carry general liability insurance, including insurance for sudden and accidental pollution. Their insurance gives you a certain degree of protection should an accident occur while pesticides are being applied in your home. Contractors may also carry workmen's compensation insurance, which can help protect you should one of their employees be injured while working in or around your apartment or house. Although most states do not require pest control companies to buy insurance, you should think twice before hiring a company that is not insured.

5 Does the company guarantee its work?

You should be skeptical about a company that does not guarantee its work. In addition, be sure to find out what you must do to keep your part of the bargain. For example, in the case of termite control treatments, the company's guarantee may become invalid if you make structural alterations to your home without giving prior notice to the pest control company.

6 Is the company affiliated with a professional pest control association?

Professional associations—national, state, or local—keep members informed of new developments in pest control methods, safety, training, research, and regulations. Members agree to honor a code of ethics. The fact that a company, small or large, chooses to join a professional association signals its concern for quality.



Ask questions before choosing a pesticide company.

You and the company of your choice should develop the contract together. Your safety concerns should be noted and reflected in the choice of pesticides to be used. These concerns may include allergies, sensitivities, age of occupants (infants or elderly), resident pets, and treatment near wildlife and fish. Wise consumers get bids from two or three companies and look at value more than price. What appears to be a bargain may warrant a second look.

If you hire a pest control firm to do the job, ask the company to use the least toxic chemical method available that will do the job. Ask to see the label or Material Safety Data Sheet, which will show precautionary warnings.

Hiring a company to take care of your pest problem does not mean your job is over. You must evaluate the results. If you believe something has gone wrong with the pesticide application, contact the company and/or your state pesticide agency. Be a responsible, wise consumer and keep asking questions until your pests are under control.

Reference Section

Calculating the Correct Amount of Pesticide To Use for Your Target Area

To determine the size of your target area outdoors (usually a square or rectangular part of your lawn or garden), measure each side and multiply the length times the width. For example, if you want to apply a pesticide in an area that is 15 feet long and 15 feet wide, multiply 15×15 to get a total of 225 square feet.

When you read the label for pesticides commonly applied outdoors, you will see measurements in square feet or in square yards. A section of lawn that is 1 yard long \times 1 yard wide has an area of 1 square yard. Because 1 yard = 3 feet, another way to calculate the same area is this: 3 feet long \times 3 feet wide = 9 square feet = 1 square yard.

To know the size of your target area indoors, you may need to determine the volume of a room. You must calculate the volume of a room, for instance, before using a bug bomb (aerosol release) to control cockroaches or fleas. In a case like this, measure and multiply the room's length times width times height. For example, if the kitchen in your apartment is 6 feet long, 5 feet wide, and 8 feet high, its volume is 240 cubic feet ($6 \times 5 = 30 \times 8 = 240$).

Tables 1 to 3 (on pages 40–41) give examples for changing measurements you find on the pesticide label to match your specific target area and pest problem.



For most pesticide uses in and around the home, you need to know some common ways to measure volume and some common abbreviations:

1 gallon (gal.)	= 16 cups
	= 8 pints (pt.)
	= 4 quarts (qt.)
	= 128 fluid ounces (fl. oz.)
1 quart (qt.)	= 4 cups
	= 2 pt.
	= 32 fl. oz.
1 pint (pt.)	= 2 cups
	= 16 fl. oz.
1 cup	= 8 fl. oz.
1 tablespoon	= 3 teaspoons
	= ½ fl. oz.
1 teaspoon	= ¼ fl. oz.
1 sq. yard	= 9 square feet = 3 ft. long \times 3 ft. wide



Not all amounts are included in the tables. For amounts not included, use the following notes as a guide:

- ◆ To figure the amount of a ready-to-use pesticide (not to be diluted with water), you must change the quantity of pesticide in the same way that you change the area/volume/number of items treated to keep the correct proportion.

For example—

$$\begin{array}{l} \frac{1}{2} \text{ lb. of pesticide} \\ \text{per 1,000 sq.ft.} \end{array} = \begin{array}{l} \frac{1}{4} \text{ lb. of pesticide} \\ \text{per 500 sq.ft.} \end{array}$$

- ◆ To figure the amount of a pesticide that is to be diluted with water, you must change the quantity of pesticide and the quantity of water in the same way that you change the area/volume/number of items treated to keep the correct proportion.

For example—

$$\begin{array}{l} 1 \text{ lb. of pesticide} \\ \text{in 2 gals. of water} \\ \text{per 2,000 sq.ft.} \end{array} = \begin{array}{l} \frac{1}{2} \text{ lb. of pesticide} \\ \text{in 1 gal. of water} \\ \text{per 1,000 sq.ft.} \end{array}$$

TABLE 1 — Diluting Pesticides with Water

Unit stands for any measure of pesticide quantity. Read across.

Pesticide Label Says:
Mix "x" Units of
Pesticide . . .

	You mix . . .	
8 units per 1 gal water	2 units per 1 qt water or	1 unit per 1 pt water
16 units per 1 gal water	4 units per 1 qt water or	2 units per 1 pt water
32 units per 1 gal water	8 units per 1 qt water or	4 units per 1 pt water
128 units per 1 gal water	32 units per 1 qt water or	16 units per 1 pt water

TABLE 2 — Measuring Pesticides for a Surface Application

Unit stands for any measure of pesticide quantity. Read across.

Pesticide Label Says: Apply "x" Units of Pesticide . . .	Your surface measures . . .		
	20,000 sq.ft.	10,000 sq.ft.	500 sq.ft.
1 unit per 1,000 sq.ft. <i>Apply:</i>	20 units	10 units	½ unit
2 units per 1,000 sq.ft.	40 units	20 units	1 unit
5 units per 1,000 sq.ft.	100 units	50 units	2½ units
10 units per 1,000 sq.ft.	200 units	100 units	5 units

TABLE 3 — Buying Pesticides for a Room Application

Read across.

Pesticide Label Says: Release One Aerosol Can . . .	Your room measures . . .		
	20,000 cu.ft.	10,000 cu.ft.	5,000 cu.ft.
1 per 10,000 cu.ft. <i>Use:</i>	2 cans	1 can	don't use
1 per 5,000 cu.ft.	4 cans	2 cans	1 can
1 per 2,500 cu.ft.	8 cans	4 cans	2 cans



You may need to measure quantities of pesticides that are too small to be measured accurately with common measuring tools available at home. In this case, you should—

- ✓ Search for another pesticide product or a less concentrated form of the same pesticide.
- ✓ Find a more accurate measuring device, such as a graduated cylinder or a scale that measures small weights.



For More Information

For additional copies of this booklet, or for more information on subjects discussed in this booklet, contact—

EPA's Public Information Center (PIC), 401 M Street, SW, Washington, DC 20460 (Telephone: 202-260-2080); or the National Center for Environmental Publications and Information (NCEPI), P.O. Box 42419, Cincinnati, OH 45242-2419 (Telephone: 513-489-8190 or Fax: 513-489-8695).

PIC and NCEPI have the following free information available:

- ◆ *Healthy Lawn, Healthy Environment* (EPA 700-K-92-005).
- ◆ *Pesticides in Drinking Water Wells* (EPA 20T-1004).
- ◆ *Pest Control in the School Environment: Adopting Integrated Pest Management* (EPA 735-F-93-012).
- ◆ *Pesticides and Child Safety* fact sheet (English and Spanish) (EPA 735-F-93-050 and EPA 735-F-93-051).
- ◆ *Using Insect Repellents Safely* fact sheet (English and Spanish).
- ◆ *Safety Precautions for Total Release Foggers* fact sheet.
- ◆ NCEPI also has EPA's *National Publications Catalog 1995* (EPA 703-B-95-001) and the *Catalog of Office of Pesticide Programs (OPP) Publications and Other Information Media* (EPA 730-B-94-001).

Other sources for information about pesticides and pest control include—

- ◆ The National Pesticide Telecommunications Network (NPTN)—1-800-858-7378 (general public), 6:30 a.m.–4:30 p.m. Pacific time (9:30 a.m.–7:30 p.m. Eastern time) Monday–Friday. NPTN provides the following information:
 - ◆ Pesticide information.
 - ◆ Information on recognizing and managing pesticide poisonings.
 - ◆ Safety information.
 - ◆ Health and environmental effects.
 - ◆ Referrals for investigation of pesticide incidents and emergency treatment information.
 - ◆ Cleanup and disposal procedures, and much more.

- ◆ County Cooperative Extension Service offices are usually listed in the telephone directory under county or state government; these offices often have a range of resources on lawn care and landscape maintenance, including plant selection, pest control, and soil testing.
- ◆ State agriculture and environmental agencies may publish information on pests, pest management strategies, and state pesticide regulations. (See state contacts on pages 45–48.)
- ◆ Libraries, bookstores, and garden centers usually have a wide selection of books that identify various pests and discuss lawn care. Garden centers may also have telephone hotlines or experts available on the premises to answer gardening questions.
- ◆ The California Department of Pesticide Regulation's Environmental Monitoring and Pest Management Branch publishes a booklet on mail order sources of biological control organisms. Single free copies of *Suppliers of Beneficial Organisms in North America* are available by writing the Department at 1020 N Street, Room 161, Sacramento, CA 95814-5624. Telephone: 916-324-4100.
- ◆ Bio-Integral Resource Center (BIRC), a non-profit organization formed in 1978 through an EPA grant, has information on least toxic methods for pest management. Write to P.O. Box 7414, Berkeley, CA 94707.

EPA Addresses

Headquarters

U.S. Environmental Protection Agency
 Office of Pesticide Programs (7506C)
 401 M Street, SW
 Washington, DC 20460
 Telephone: (703) 305-5017
 Fax: (703) 305-5558

EPA Regional Offices

U.S. EPA, Region 1
 Air, Pesticides and Toxic Management
 Division
 State Assistance Office (ASO)
 1 Congress Street
 Boston, MA 02203
 Telephone: (617) 565-3932
 Fax: (617) 565-4939

U.S. EPA, Region 2
 Building 10 (MS-105)
 Pesticides and Toxics Branch
 2890 Woodbridge Avenue
 Edison, NJ 08837-3679
 Telephone: (908) 321-6765
 Fax: (908) 321-6788

U.S. EPA, Region 3
 Toxics and Pesticides Branch (3AT-30)
 841 Chestnut Building
 Philadelphia, PA 19107
 Telephone: (215) 597-8598
 Fax: (215) 597-3156

U.S. EPA, Region 4
 Pesticides and Toxics Branch
 (+APT-MD)
 345 Courtland Street, NE
 Atlanta, GA 30365
 Telephone: (404) 347-5201
 Fax: (404) 347-5056

U.S. EPA, Region 5
 Pesticides and Toxics Branch (SP-14f)
 77 West Jackson Boulevard
 Chicago, IL 60604
 Telephone: (312) 886-6006
 Fax: (312) 353-4342

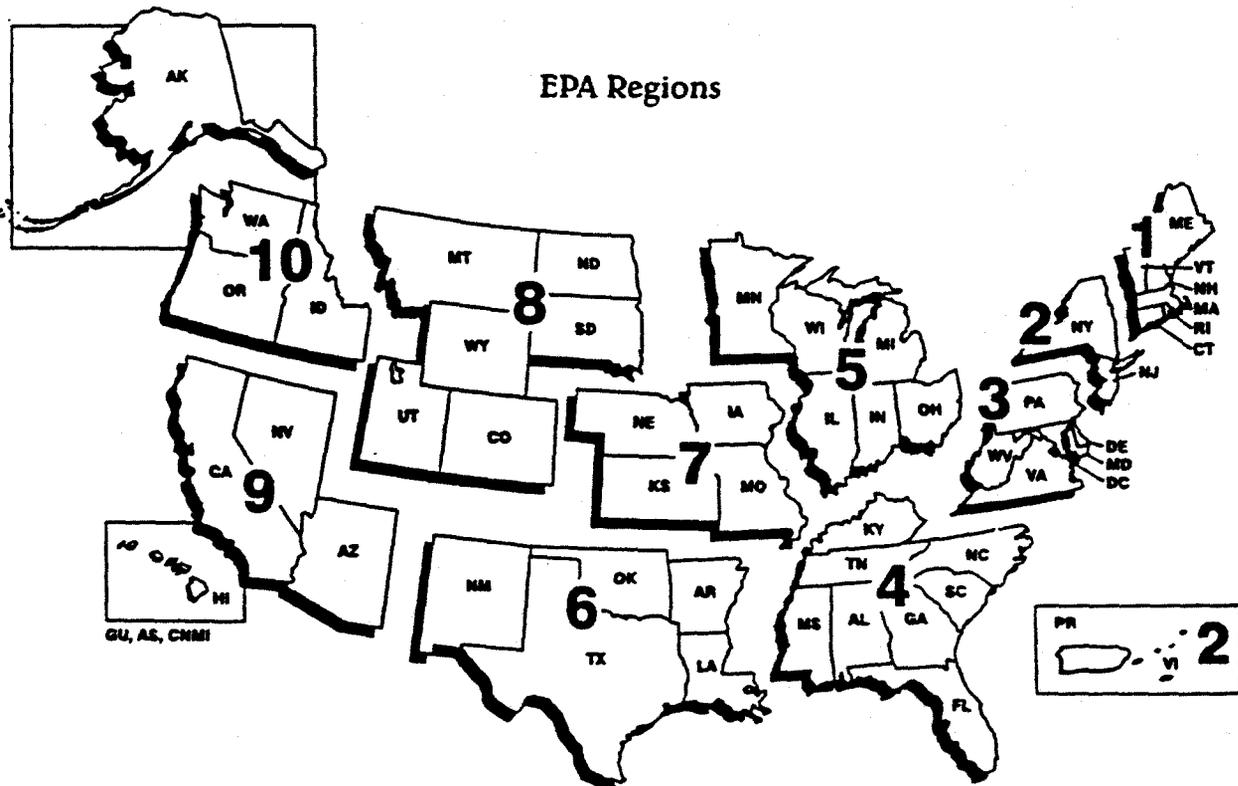
U.S. EPA, Region 6
 Pesticides and Toxics Branch (6PD-P)
 1445 Ross Avenue
 Dallas, TX 75202-2733
 Telephone: (214) 665-7240
 Fax: (214) 665-7263

U.S. EPA, Region 7
 Water, Wetlands and Pesticides Division
 726 Minnesota Avenue
 Kansas City, KS 66101
 Telephone: (913) 551-7030
 Fax: (913) 551-7065

U.S. EPA, Region 8
 Air, Radiation and Toxics Division
 (8ART)
 One Denver Place, Suite 500
 999 18th Street
 Denver, CO 80202-2405
 Telephone: (303) 293-1730
 Fax: (303) 293-1229

U.S. EPA, Region 9
 Pesticides and Toxics Branch (A-4)
 75 Hawthorne Street
 San Francisco, CA 94105
 Telephone: (415) 744-1090
 Fax: (415) 744-1073

U.S. EPA, Region 10
 Pesticides and Toxics Branch (AT-083)
 1200 Sixth Avenue
 Seattle, WA 98101
 Telephone: (206) 553-1091
 Fax: (206) 553-8338



Addresses for State Pesticide Agencies

Region 1

Connecticut
 Director
 Pesticide Management Division
 Department of Environmental
 Protection
 79 Elm Street
 Hartford, CT 06106
 (203) 424-3369

Maine
 Director
 Board of Pesticide Control
 Maine Department of Agriculture
 State House Station #28
 Augusta, ME 04333
 (207) 287-2731

Massachusetts
 Chief
 Pesticides Bureau
 Massachusetts Department of Food
 and Agriculture
 100 Cambridge Street, 21st Floor
 Boston, MA 02202
 (617) 727-3000

New Hampshire
 Director
 Division of Pesticide Control
 New Hampshire Department of
 Agriculture, Markets and Food
 P.O. Box 2042
 Concord, NH 03302-2042
 (603) 271-3550

Rhode Island
 Chief
 Division of Agriculture
 Rhode Island Department of
 Environmental Management
 22 Hayes Street
 Providence, RI 02908
 (401) 277-2782

Vermont
 Director
 Plant Industry, Laboratory and
 Standards Division
 Vermont Department
 of Agriculture
 116 State Street
 Montpelier, VT 05602
 (802) 828-2431

Region 2

New Jersey
 Assistant Director
 Pesticide Control Program
 New Jersey Department of
 Environmental Protection
 CN 411
 Trenton, NJ 08625-0411
 (609) 530-4011

New York
 Chief
 Bureau of Pesticides and Radiation
 Division of Solid and Hazardous
 Materials Regulation
 New York Department of
 Environmental Conservation
 50 Wolf Road
 Albany, NY 12233-7254
 (518) 457-7482

Puerto Rico
 Director
 Analysis and Registration of
 Agricultural Materials
 Puerto Rico Department of Agriculture
 Agrological Laboratory
 P.O. Box 10163
 Santurce, PR 00908
 (809) 796-1735

Virgin Islands
 Pesticide Program Director
 8000 Nisky Center, Suite 231
 Estate Nisky, Charlotte Amalie
 St. Thomas, US VI 00802
 (809) 774-3320, ext. 135

Region 3

Delaware
 Deputy Secretary
 Delaware Department of Agriculture
 Division of Consumer Protection
 2320 South DuPont Highway
 Dover, DE 19901
 (302) 739-4811

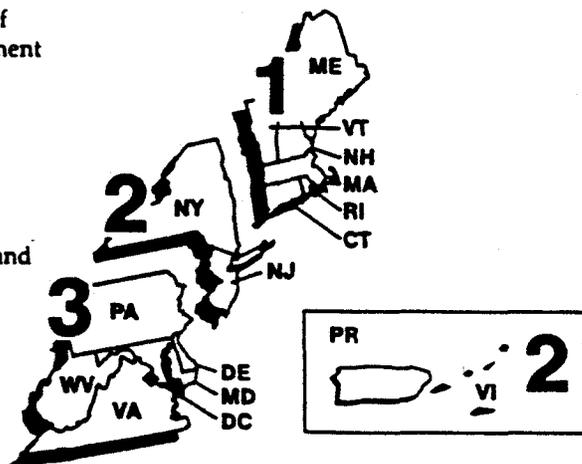
District of Columbia
 Program Manager
 Pesticide Hazardous Waste and
 Underground Storage Tank Division
 Environmental Regulation
 Administration
 Department of Consumer and
 Regulatory Affairs
 2100 Martin Luther King, Jr.
 Avenue, SE, Room 203
 Washington, DC 20020
 (202) 645-6080

Maryland
 Chief
 Pesticide Regulation Section
 Office of Plant Industries and
 Pest Management
 Maryland Department of Agriculture
 50 Harry S. Truman Parkway
 Annapolis, MD 21401-7080
 (410) 841-5710

Pennsylvania
 Chief
 Agronomic Services Division
 Bureau of Plant Industry
 Pennsylvania Department of
 Agriculture
 2301 North Cameron Street
 Harrisburg, PA 17110-9408
 (717) 787-4843

Virginia
 Program Manager
 Office of Pesticide Services
 Virginia Department of Agriculture
 and Consumer Service
 P.O. Box 1163
 Richmond, VA 23209
 (804) 371-6558

West Virginia
 Director
 Pesticide Division
 West Virginia Department of
 Agriculture
 1900 Kanawha Boulevard, East
 Charleston, WV 25305-0190
 (304) 558-2209



State Pesticide Agencies (cont'd)

Region 4

Alabama
 Director
 Division of Plant Protection and
 Pesticide Management
 Alabama Department of
 Agriculture and Industries
 P.O. Box 3336
 Montgomery, AL 36109-0336
 (334) 242-2656

Florida
 Director
 Division of Agricultural
 Environmental Services
 Department of Agriculture
 and Consumer Services
 3125 Conner Boulevard
 Tallahassee, FL 32399-1650
 (904) 488-3731

Georgia
 Assistant Commissioner
 Plant Industry Division
 Georgia Department of Agriculture
 19 Martin Luther King Drive, SW
 Atlanta, GA 30334
 (404) 656-4958

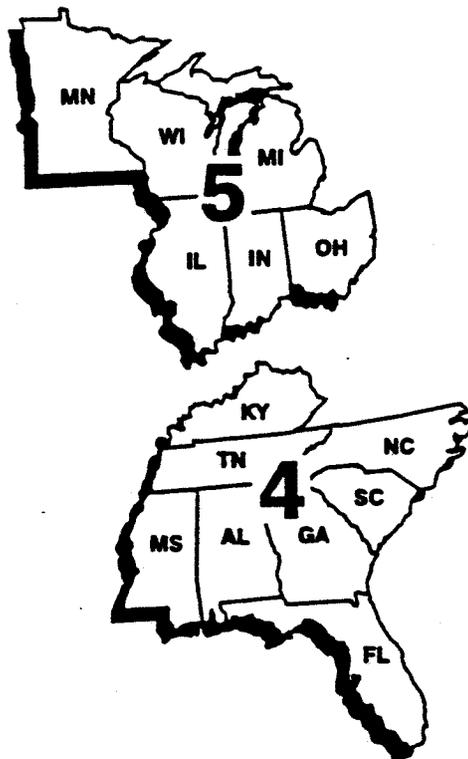
Kentucky
 Director
 Division of Pesticides
 Kentucky Department
 of Agriculture
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 Frankfort, KY 40601
 (502) 564-7274

Mississippi
 Director
 Bureau of Plant Industry
 Mississippi Department of
 Agriculture and Commerce
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 Mississippi State, MS 39762
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North Carolina
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 Food and Drug Protection Division
 North Carolina Department of
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 Raleigh, NC 27611-0647
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 Department Head
 Department of Pesticide Regulation
 257 Poole Agriculture Center
 Clemson University
 Clemson, SC 29634-0394
 (803) 656-3171

Tennessee
 Director
 Plant Industries Division
 Tennessee Department of Agriculture
 P.O. Box 40627
 Nashville, TN 37204
 (615) 360-0130



Region 5

Illinois
 Chief
 Bureau of Environmental Programs
 Illinois Department of Agriculture
 P.O. Box 19281
 Springfield, IL 62794-9281
 (217) 785-2427

Indiana
 Pesticide Administrator
 Office of the Indiana State Chemist
 1154 Biochemistry Building
 Purdue University
 West Lafayette, IN 47907-1154
 (317) 494-1585

Michigan
 Director
 Pesticide and Plant
 Management Division
 Michigan Department of Agriculture
 P.O. Box 30017
 Lansing, MI 48909
 (517) 373-1087

Minnesota
 Director
 Division of Agronomy Services
 Minnesota Department of Agriculture
 90 West Plato Boulevard
 St. Paul, MN 55107
 (612) 296-5639

Ohio
 Specialist in Charge of
 Pesticide Regulation
 Division of Plant Industry
 Ohio Department of Agriculture
 8995 East Main Street
 Reynoldsburg, OH 43068-3399
 (614) 728-6987

Wisconsin
 Administrator
 Agricultural Resources
 Management Division
 Wisconsin Department of Agriculture
 Trade and Consumer Protection
 2811 Agriculture Drive
 Madison, WI 53704
 (608) 224-4546

State Pesticide Agencies (cont'd)

Region 6

Arkansas
 Director
 Division of Feeds, Fertilizer
 and Pesticides
 Arkansas State Plant Board
 #1 Natural Resources Drive
 Little Rock, AR 72205
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Louisiana
 Director
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 Louisiana Department of
 Agriculture and Forestry
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 Baton Rouge, LA 70821-3596
 (504) 925-3763

New Mexico
 Chief
 Bureau of Pesticide Management
 Division of Agricultural and
 Environmental Services
 New Mexico State Department
 of Agriculture
 P.O. Box 3005, Department 3AQ
 New Mexico State University
 Las Cruces, NM 88003-0005
 (505) 646-2133

Oklahoma
 Director
 Department of Environmental Quality
 Plant Industry and Consumer Services
 Oklahoma Department of Agriculture
 2800 North Lincoln Boulevard
 Oklahoma City, OK 73105-4298
 (405) 271-1400

Texas
 Assistant Commissioner for
 Pesticides
 Texas Department of
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 P.O. Box 12847
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 (512) 463-7624

Region 7

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 Chief
 Pesticide Bureau
 Iowa Department of Agriculture
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Kansas
 Director
 Plant Health Division
 Kansas Department of Agriculture
 109 S.W. 9th Street
 Topeka, KS 66612-1281
 (913) 296-2263

Missouri
 Director
 Bureau of Pesticide Control
 Missouri Department of Agriculture
 P.O. Box 630
 Jefferson City, MO 65102
 (314) 751-2462

Nebraska
 Director
 Bureau of Plant Industry
 Nebraska Department of Agriculture
 301 Centennial Mall
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 Lincoln, NE 68509
 (402) 471-2394

Region 8

Colorado
 Director
 Division of Plant Industry
 Colorado Department of Agriculture
 700 Kipling Street, Suite 4000
 Lakewood, CO 80215-5894
 (303) 239-4140

Montana
 Administrator
 Agricultural Sciences Division
 Montana Department of Agriculture
 P.O. Box 200201
 Helena, MT 59620-0201
 (406) 444-2944

North Dakota
 Director
 Pesticide Division
 North Dakota Department
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 6th Floor
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South Dakota
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 Agricultural Services
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 Foss Building
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Utah
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 Division of Plant Industry
 Utah Department of Agriculture
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 Salt Lake City, UT 84114-6500
 (801) 538-7180

Wyoming
 Director
 Technical Services
 Wyoming Department of Agriculture
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 (307) 777-6590



State Pesticide Agencies (cont'd)

Region 9

Arizona
 Director
 Environmental Services Division
 Arizona Department of Agriculture
 1688 West Adams
 Phoenix, AZ 85007
 (602) 542-3578

California
 Director
 California Department of
 Pesticide Regulation
 1020 N Street, Room 100
 Sacramento, CA 95814-5624
 (916) 445-4300

Hawaii
 Administrator
 Pesticide Programs
 Hawaii Department of Agriculture
 P.O. Box 22159
 Honolulu, HI 96823-2159
 (808) 973-9401

Nevada
 Director
 Bureau of Plant Industry
 Nevada Division of
 Agriculture
 350 Capitol Hill Avenue
 Reno, NV 89520
 (702) 688-1180

Guam
 Pesticide Program Director
 Guam Environmental
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 Barrigada, GU 96921
 (671) 472-8863

American Samoa EPA
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 American Samoa Government
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 Pago Pago, American Samoa 97699
 (684) 633-2304

**Commonwealth of the Northern
 Mariana Islands**
 Department of Public Works
 Division of Environmental Quality
 Commonwealth of the Northern
 Mariana Islands (CNMI)
 P.O. Box 1304
 Saipan, Mariana Islands 96950
 (670) 234-6984

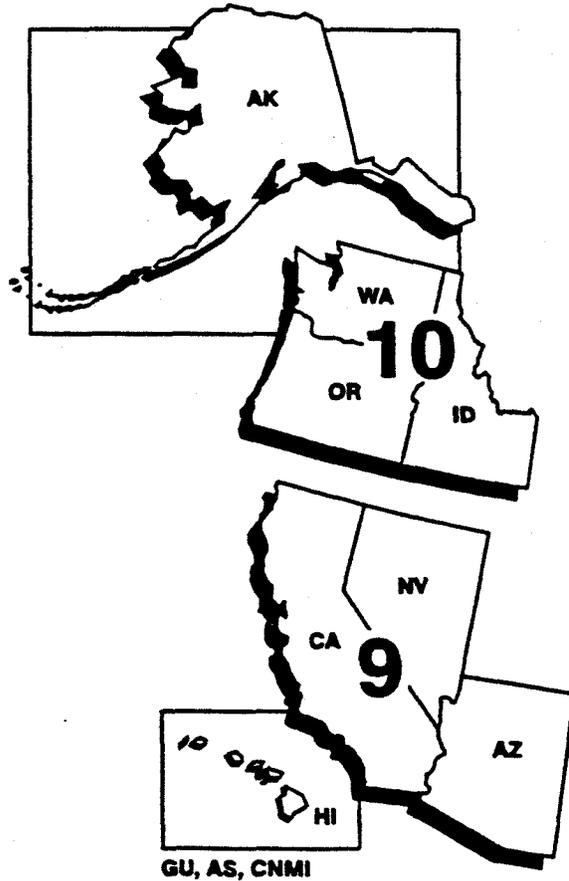
Region 10

Idaho
 Administrator
 Division of Agricultural Technology
 Idaho Department of Agriculture
 P.O. Box 790
 Boise, ID 83701-0790
 (208) 334-3550

Oregon
 Administrator
 Plant Division
 Oregon Department of Agriculture
 635 Capitol Street, NE
 Salem, OR 97310-0110
 (503) 986-4635

Washington
 Assistant Director
 Pesticide Management Division
 Washington State Department
 of Agriculture
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 Olympia, WA 98504-2560
 (360) 902-2010

Alaska
 Director
 Division of Environmental Health
 Alaska Department of
 Environmental Conservation
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 Juneau, AK 99801-1795
 (907) 465-5280



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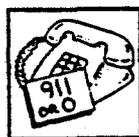
"Help! Someone's Been Poisoned!" What To Do in a Pesticide Emergency



If the person is unconscious, having trouble breathing, or having convulsions . . .
ACT FAST! Speed is crucial.



Give needed first aid immediately.



Call 911 or your local emergency service. If possible, have someone else call for emergency help while you give first aid.



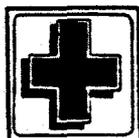
If the person is awake or conscious, not having trouble breathing, and not having convulsions . . .



Read the label for first aid instructions.



Call a doctor, a poison control center, a local emergency service (911), or the National Pesticide Telecommunications Network (toll free at 1-800-858-7378).



Give first aid.

6/15/92

**MODEL
WATER EFFICIENT
LANDSCAPE
ORDINANCE**

NOV 09 1993

490. Purpose.

(a) The State Legislature has found:

- (1) that the limited supply of state waters are subject to ever increasing demands;
- (2) that California's economic prosperity depends on adequate supplies of water;
- (3) that state policy promotes conservation and efficient use of water;
- (4) that landscapes provide recreation areas, clean the air and water, prevent erosion, offer fire protection, and replace ecosystems displaced by development; and
- (5) that landscape design, installation, and maintenance can and should be water efficient.

(b) Consistent with the legislative findings, the purpose of this model ordinance is to:

- (1) promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;
- (2) establish a structure for designing, installing, and maintaining water efficient landscapes in new projects; and
- (3) establish provisions for water management practices and water waste prevention for established landscapes.

Note: Authority cited: Sections 65591.5, 65594, Gov. Code. Reference: Sections 65591, 65591.5, 65597, Gov. Code.

491. Definitions.

The words used in this ordinance have the meaning set forth below.

- (a) "anti-drain valve" or "check valve" means a valve located under a sprinkler head to hold water in the system so it minimizes drainage from the lower elevation sprinkler heads.
- (b) "application rate" means the depth of water applied to a given area, usually measured in inches per hour.
- (c) "applied water" means the portion of water supplied by the irrigation system to the landscape.
- (d) "automatic controller" means a mechanical or solid state timer, capable of operating valve stations to set the days and length of time of a water application.
- (e) "backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.
- (f) "conversion factor (0.62)" means a number that converts the maximum applied water allowance from acre-inches per acre per year to gallons per square foot per year. The conversion factor is calculated as follows:

$$\begin{aligned} (325,851 \text{ gallons} / 43,560 \text{ square feet}) / 12 \text{ inches} &= (0.62) \\ 325,851 \text{ gallons} &= \text{one acre foot} \\ 43,560 \text{ square feet} &= \text{one acre} \\ 12 \text{ inches} &= \text{one foot} \end{aligned}$$

To convert gallons per year to 100-cubic-feet per year, another common billing unit for water, divide gallons per year by 748. (748 gallons = 100 cubic feet.)

(g) "ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

(h) "effective precipitation" or "usable rainfall" means the portion of total precipitation that is used by the plants. Precipitation is not a reliable source of water, but can contribute to some degree toward the water needs of the landscape.

(i) "emitter" means drip irrigation fittings that deliver water slowly from the system to the soil.

(j) "established landscape" means the point at which plants in the landscape have developed roots into the soil adjacent to the root ball.

(k) "establishment period" means the first year after installing the plant in the landscape.

(l) "Estimated Applied Water Use" means the portion of the Estimated Total Water Use that is derived from applied water. The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance. The Estimated Applied Water Use may be the sum of the water recommended through the irrigation schedule, as referenced in Section 492 (c) (3).

(m) "Estimated Total Water Use" means the annual total amount of water estimated to be needed to keep the plants in the landscaped area healthy. It is based upon such factors as the local evapotranspiration rate, the size of the landscaped area, the types of plants, and the efficiency of the irrigation system, as described in Section 492 (c) (4).

(n) "ET adjustment factor" means a factor of 0.8, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.

A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. The irrigation efficiency for purposes of the ET Adjustment Factor is 0.625.

Therefore, the ET Adjustment Factor $(0.8) = (0.5/0.625)$.

(o) "evapotranspiration" means the quantity of water evaporated from adjacent soil surfaces and transpired by plants during a specific time.

(p) "flow rate" means the rate at which water flows through pipes and valves (gallons per minute or cubic feet per second).

(q) "hydrozone" means a portion of the landscaped area having plants with similar water needs that are served by a valve or set of valves with the same schedule. A hydrozone may be irrigated or non-irrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation once established is a non-irrigated hydrozone.

(r) "infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).

(s) "irrigation efficiency" means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum irrigation efficiency for purposes of this ordinance is 0.625. Greater irrigation efficiency can be expected from well designed and maintained systems.

(t) "landscape irrigation audit" means a process to perform site inspections, evaluate irrigation systems, and develop efficient irrigation schedules.

(kk) "run off" means water which is not absorbed by the soil or landscape to which it is applied and flows from the area. For example, run off may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a severe slope.

(ll) "soil moisture sensing device" means a device that measures the amount of water in the soil.

(mm) "soil texture" means the classification of soil based on the percentage of sand, silt, and clay in the soil.

(nn) "sprinkler head" means a device which sprays water through a nozzle.

(oo) "static water pressure" means the pipeline or municipal water supply pressure when water is not flowing.

(pp) "station" means an area served by one valve or by a set of valves that operate simultaneously.

(qq) "turf" means a surface layer of earth containing mowed grass with its roots. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

(rr) "valve" means a device used to control the flow of water in the irrigation system.

(ss) "water conservation concept statement" means a one-page checklist and a narrative summary of the project as shown in Section 492 (c) (1).

Note: Section 65594, Gov. Code. Reference: Section 65597, Gov. Code.

492. Provisions for New or Rehabilitated Landscapes

(a) Applicability

(1) Except as provided in Section 492 (a) (3), this section shall apply to:

(A) all new and rehabilitated landscaping for public agency projects and private development projects that require a permit; and

(B) developer-installed landscaping in single-family and multi-family projects.

(2) Projects subject to this section shall conform to the provisions in Section 492.

(3) This section shall not apply to:

(A) homeowner-provided landscaping at single-family and multi-family projects;

(B) cemeteries;

(C) registered historical sites;

(D) ecological restoration projects that do not require a permanent irrigation system;

(E) mined-land reclamation projects that do not require a permanent irrigation system; or

(F) any project with a landscaped area less than 2,500 square feet.

- (u) "landscaped area" means the entire parcel less the building footprint, driveways, non-irrigated portions of parking lots, hardscapes- such as decks and patios, and other non-porous areas. Water features are included in the calculation of the landscaped area. Areas dedicated to edible plants, such as orchards or vegetable gardens are not included.
- (v) "lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.
- (w) "main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.
- (x) "Maximum Applied Water Allowance" means, for design purposes, the upper limit of annual applied water for the established landscaped area as specified in Section 492 (c) (2). It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscaped area. The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance.
- (y) "mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
- (z) "mulch" means any material such as leaves, bark, straw or other materials left loose and applied to the soil surface for the beneficial purpose of reducing evaporation .
- (aa) "operating pressure" means the pressure at which a system of ~~sprinklers~~ is designed to operate, usually indicated at the base of a ~~sprinkler~~.
- (bb) "overhead sprinkler irrigation systems" means those with high flow rates (pop-ups, impulse sprinklers, rotors, etc.)
- (cc) "overspray" means the water which is delivered beyond the landscaped area, wetting pavements, walks, structures, or other non-landscaped areas.

- (dd) "plant factor" means a factor that when multiplied by reference evapotranspiration, estimates the amount of water used by plants. For purposes of this ordinance, the average plant factor of low water using plants ranges from 0 to 0.3, for average water using plants the range is 0.4 to 0.6, and for high water using plants the range is 0.7 to 1.0.
- (ee) "rain sensing device" means a system which automatically shuts off the irrigation system when it rains.
- (ff) "record drawing" or "as-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.
- (gg) "recreational area" means areas of active play or recreation such as sports fields, school yards, picnic grounds, or other areas with intense foot traffic.
- (hh) "recycled water," "reclaimed water," or "treated sewage effluent water" means treated or recycled waste water of a quality suitable for nonpotable uses such as landscape irrigation; not intended for human consumption.
- (ii) "reference evapotranspiration" or "ET_e" means a standard measurement of environmental parameters which affect the water use of plants. ET_e is given in inches per day, month, or year as represented in Section 495, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowances so that regional differences in climate can be accommodated.
- (jj) "rehabilitated landscape" means any relandscaping project that requires a permit.

(b) Landscape Documentation Package

(1) A copy of the landscape documentation package conforming to this chapter shall be submitted to the city or county. No permit shall be issued until the city or county reviews and approves the landscape documentation package.

(2) A copy of the approved landscape documentation package shall be provided to the property owner or site manager along with the record drawings and any other information normally forwarded to the property owner or site manager.

(3) A copy of the Water Conservation Concept Statement and the Certificate of Substantial Completion shall be sent by the project manager to the local retail water purveyor.

(4) Each landscape documentation package shall include the following elements, which are described in Section 492 (c):

- (A) Water Conservation Concept Statement
- (B) Calculation of the Maximum Applied Water Allowance
- (C) Calculation of the Estimated Applied Water Use
- (D) Calculation of the Estimated Total Water Use
- (E) Landscape Design Plan
- (F) Irrigation Design Plan
- (G) Irrigation Schedules
- (H) Maintenance Schedule
- (I) Landscape Irrigation Audit Schedule
- (J) Grading Design Plan
- (K) Soil Analysis
- ~~(L)~~ Certificate of Substantial Completion. (To be submitted after installation of the project.)

(5) If effective precipitation is included in the calculation of the Estimated Total Water Use, then an Effective Precipitation Disclosure Statement from the landscape professional and the property owner shall be submitted with the Landscape Documentation Package.

(c) Elements of Landscape Documentation Package

(1) Water Conservation Concept Statement

Each landscape documentation package shall include a cover sheet, referred to as the Water Conservation Concept Statement similar to the following example. It serves as a check list to verify that the elements of the landscape documentation package have been completed and has a narrative summary of the project.

Sample Water Conservation Concept Statement

Project Site: _____ Project Number: _____
 Project Location: _____
 Landscape Architect/ Irrigation Designer/ Contractor: _____

Included in this project submittal package are:
 (Check to indicate completion)

- ___ 1. Maximum Applied Water Allowance: _____gallons or cubic feet/year
- ___ 2. Estimated Applied Water Use: _____gallons or cubic feet/year
- * ___ 2.(a) Estimated Amount of Water Expected from Effective Precipitation: _____gallons or cubic feet/year
- ___ 3. Estimated Total Water Use: _____gallons or cubic feet/year

Note: * If the design assumes that a part of the Estimated Total Water Use will be provided by precipitation, the Effective Precipitation Disclosure Statement in Section 494 shall be completed and submitted.

- ___ 4. Landscape Design Plan
- ___ 5. Irrigation Design Plan
- ___ 6. Irrigation Schedules
- ___ 7. Maintenance Schedule
- ___ 8. Landscape Irrigation Audit Schedule
- ___ 9. Grading Design Plan
- ___ 10. Soil Analysis

(Sample Water Conservation Concept Statement, continued)**Description of Project**

(Briefly describe the planning and design actions that are intended to achieve conservation and efficiency in water use.)

Date: _____ Prepared By: _____

(2) The Maximum Applied Water Allowance

(A) A project's Maximum Applied Water Allowance shall be calculated using the following formula:

MAWA = (ETo) (0.8) (LA) (0.62) where:

MAWA = Maximum Applied Water Allowance (gallons per year)
 ETo = Reference Evapotranspiration (inches per year)
 0.8 = ET Adjustment Factor
 LA = Landscaped Area (square feet)
 0.62 = conversion factor (to gallons per square foot)

(B) Two example calculations of the Maximum Applied Water Allowance are:

(i) PROJECT SITE ONE: Landscaped area of 50,000 sq. ft. in Fresno

MAWA = (ETo) (.8) (LA) (.62)
 = (51 inches) (.8) (50,000 square feet) (.62)
 Maximum Applied Water Allowance = 1,264,800 gallons per year
 (or 1,691 hundred-cubic-feet per year: $1,264,800/748=1,691$)

(ii) PROJECT SITE TWO: Landscaped area of 50,000 sq. ft. in San Francisco

MAWA = (ETo) (.8) (LA) (.62)
 = (35 inches) (.8) (50,000 square feet) (.62)
 Maximum Applied Water Allowance = 868,000 gallons per year
 (or 1,160 hundred-cubic-feet per year)

(C) Portions of landscaped areas in public and private projects such as parks, playgrounds, sports fields, golf courses, or school yards where turf provides a playing surface or serves other recreational purposes are considered recreational areas and may require water in addition to the Maximum Applied Water Allowance. A statement shall be included with the landscape design plan, designating recreational areas to be used for such purposes and specifying any needed amount of additional water above the Maximum Applied Water Allowance.

(3) Estimated Applied Water Use

(A) The Estimated Applied Water Use shall not exceed the Maximum Applied Water Allowance.

(B) A calculation of the Estimated Applied Water Use shall be submitted with the Landscape Documentation Package. It may be calculated by summing the amount of water recommended in the irrigation schedule.

(4) Estimated Total Water Use

(A) A calculation of the Estimated Total Water Use shall be submitted with the Landscape Documentation Package. The Estimated Total Water Use may be calculated by summing the amount of water recommended in the irrigation schedule and adding any amount of water expected from effective precipitation (not to exceed 25 percent of the local annual mean precipitation) or may be calculated from a formula such as the following:

The Estimated Total Water Use for the entire landscaped area equals the sum of the Estimated Water Use of all hydrozones in that landscaped area.

$$EWU (\text{hydrozone}) = (ET_o) (PF) (HA) (.62) / (IE)$$

EWU (hydrozone) = Estimated Water Use (gallons per year)
 ET_o = Reference Evapotranspiration (inches per year)
 PF = plant factor
 HA = hydrozone area (square feet)
 (.62) = conversion factor
 IE = irrigation efficiency

(B) If the Estimated Total Water Use is greater than the Estimated Applied Water Use due to precipitation being included as a source of water, an Effective Precipitation Disclosure Statement such as the one in Section 494 shall be included in the Landscape Documentation Package.

(5) Landscape Design Plan

A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package.

(A) Plant Selection and Grouping

(i) Any plants may be used in the landscape, providing the Estimated Applied Water Use recommended does not exceed the Maximum Applied Water Allowance and that the plants meet the specifications set forth in (ii), (iii) and (iv).

(ii) Plants having similar water use shall be grouped together in distinct hydrozones.

(iii) Plants shall be selected appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the site. Protection and preservation of native species and natural areas is encouraged. The planting of trees is encouraged wherever it is consistent with the other provisions of this ordinance.

(iv) Fire prevention needs shall be addressed in areas that are fire prone. Information about fire prone areas and appropriate landscaping for fire safety is available from local fire departments or the California Department of Forestry.

(B) Water Features

(i) Recirculating water shall be used for decorative water features.

(ii) Pool and spa covers are encouraged.

(C) Landscape Design Plan Specifications

The landscape design plan shall be drawn on project base sheets at a scale that accurately and clearly identifies:

- (i) Designation of hydrozones.
- (ii) Landscape materials, trees, shrubs, groundcover, turf, and other vegetation. Planting symbols shall be clearly drawn and plants labeled by botanical name, common name, container size, spacing, and quantities of each group of plants indicated.
- (iii) Property lines and street names.
- (iv) Streets, driveways, walkways, and other paved areas.
- (v) Pools, ponds, water features, fences, and retaining walls.
- (vi) Existing and proposed buildings and structures including elevation if applicable.
- (vii) Natural features including but not limited to rock outcroppings, existing trees, shrubs that will remain.
- (viii) Tree staking, plant installation, soil preparation details, and any other applicable planting and installation details.
- (ix) A calculation of the total landscaped area.
- (x) Designation of recreational areas.

(6) Irrigation Design Plan

An irrigation design plan meeting the following conditions shall be submitted as part of the Landscape Documentation Package.

(A) Irrigation Design Criteria

(i) Runoff and Overspray. Soil types and infiltration rate shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates therefore minimizing runoff.

Special attention shall be given to avoid runoff on slopes and to avoid overspray in planting areas with a width less than ten feet, and in median strips.

No overhead sprinkler irrigation systems shall be installed in median strips less than ten feet wide.

(ii) Irrigation Efficiency. For the purpose of determining the maximum applied water allowance, irrigation efficiency is assumed to be 0.625. Irrigation systems shall be designed, maintained, and managed to meet or exceed 0.625 efficiency.

(iii) Equipment.

Water meters. Separate landscape water meters shall be installed for all projects except for single family homes or any project with a landscaped area of less than 5,000 square feet.

Controllers. Automatic control systems shall be required for all irrigation systems and must be able to accommodate all aspects of the design.

Valves. Plants which require different amounts of water shall be irrigated by separate valves. If one valve is used for a given area, only plants with similar water use shall be used in that area. Anti-drain (check) valves shall be installed in strategic points to minimize or prevent low-head drainage.

Sprinkler heads. Heads and emitters shall have consistent application rates within each control valve circuit. Sprinkler heads shall be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance.

Rain Sensing Override Devices. Rain sensing override devices shall be required on all irrigation systems.

Soil Moisture Sensing Devices. It is recommended that soil moisture sensing devices be considered where appropriate.

(B) Recycled Water

(i) The installation of recycled water irrigation systems (dual distribution systems) shall be required to allow for the current and future use of recycled water, unless a written exemption has been granted as described in the following section (B) (ii).

(ii) Irrigation systems shall make use of recycled water unless a written exemption has been granted by the local water agency, stating that recycled water meeting all health standards is not available and will not be available in the foreseeable future.

(iii) The recycled water irrigation systems shall be designed and operated in accordance with all local and state codes.

(8) Maintenance Schedules

A regular maintenance schedule satisfying the following conditions shall be submitted as part of the Landscape Documentation Package:

(A) Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule shall include but not be limited to checking, adjusting, and repairing irrigation equipment; resetting the automatic controller; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning, and weeding in all landscaped areas.

(B) Whenever possible, repair of irrigation equipment shall be done with the originally specified materials or their equivalents.

(9) Landscape Irrigation Audit Schedules

A schedule of landscape irrigation audits, for all but single family residences, satisfying the following conditions shall be submitted to the city or county as part of the Landscape Documentation Package.

(A) At a minimum, audits shall be in accordance with the State of California Landscape Water Management Program as described in the Landscape Irrigation Auditor Handbook, the entire document, which is hereby incorporated by reference. (See Landscape Irrigation Auditor Handbook (June 1990) version 5.5 [formerly Master Auditor Training].)

(B) The schedule shall provide for landscape irrigation audits to be conducted by certified landscape irrigation auditors at least once every five years.

(10) Grading Design Plan

Grading design plans satisfying the following conditions shall be submitted as part of the Landscape Documentation Package:

(A) A grading design plan shall be drawn on project base sheets. It shall be separate from but use the same format as the landscape design plan.

(C) Irrigation Design Plan Specifications

Irrigation systems shall be designed to be consistent with hydrozones.

The irrigation design plan shall be drawn on project base sheets. It shall be separate from, but use the same format as, the landscape design plan. The scale shall be the same as that used for the landscape design plan described in Section 492 (c) (5) (C).

The irrigation design plan shall accurately and clearly identify:

- (i) Location and size of separate water meters for the landscape.
- (ii) Location, type, and size of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, and backflow prevention devices.
- (iii) Static water pressure at the point of connection to the public water supply.
- (iv) Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (psi) for each station.
- (v) Recycled water irrigation systems as specified in the Section 492 (c) (4) (B).

(7) Irrigation Schedules

Irrigation schedules satisfying the following conditions shall be submitted as part of the Landscape Documentation Package.

(A) An annual irrigation program with monthly irrigation schedules shall be required for the plant establishment period, for the established landscape, and for any temporarily irrigated areas.

(B) The irrigation schedule shall:

(i) include run time (in minutes per cycle), suggested number of cycles per day, and frequency of irrigation for each station; and

(ii) provide the amount of applied water (in hundred cubic feet, gallons, or in whatever billing units the local water supplier uses) recommended on a monthly and annual basis.

(C) The total amount of water for the project shall include water designated in the Estimated Total Water Use calculation plus water needed for any water features, which shall be considered as a high water using hydrozone.

(D) Recreational areas designated in the landscape design plan shall be highlighted and the irrigation schedule shall indicate if any additional water is needed above the Maximum Applied Water Allowance because of high plant factors (but not due to irrigation inefficiency.)

(E) Whenever possible, irrigation scheduling shall incorporate the use of evapotranspiration data such as those from the California Irrigation Management Information System (CIMIS) weather stations to apply the appropriate levels of water for different climates.

(F) Whenever possible, landscape irrigation shall be scheduled between 2:00 a.m. and 10:00 a.m. to avoid irrigating during times of high wind or high temperature.

(B) The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade.

(11) Soils

(A) A soil analysis satisfying the following conditions shall be submitted as part of the Landscape Documentation Package.

(i) Determination of soil texture, indicating the percentage of organic matter.

(ii) An approximate soil infiltration rate (either measured or derived from soil texture/infiltration rate tables.) A range of infiltration rates shall be noted where appropriate.

(iii) Measure of pH, and total soluble salts.

(B) A mulch of at least three inches shall be applied to all planting areas except turf.

(12) Certification

(A) Upon completing the installation of the landscaping and the irrigation system, an irrigation audit shall be conducted by a certified landscape irrigation auditor prior to the final field observation. (See Landscape Irrigation Auditor Handbook as referenced in Section 492 (c)(9)(A)).

(B) A licensed landscape architect or contractor, certified irrigation designer, or other licensed or certified professional in a related field shall conduct a final field observation and shall provide a certificate of substantial completion to the city or county. The certificate shall specifically indicate that plants were installed as specified, that the irrigation system was installed as designed, and that an irrigation audit has been performed, along with a list of any observed deficiencies.

(C) Certification shall be accomplished by completing a Certificate of Substantial Completion and delivering it to the city or county, to the retail water supplier, and to the Owner of Record. A sample of such a form, which shall be provided by the city or county is:

(Certificate of Substantial Completion, continued)

____ Project submittal package and a copy of this certification has been provided to owner/manager and local water agency

Comments:

I/we certify that work has been installed in accordance with the contract documents.

Contractor	Signature	Date	State License Number
------------	-----------	------	----------------------

I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation conform with the approved plans and specifications.

Landscape Architect or Irrigation Designer/Consultant or Licensed or Certified Professional in a Related Field	Signature	Date	State License Number
--	-----------	------	----------------------

I/we certify that I/we have received all of the contract documents and that it is our responsibility to see that the project is maintained in accordance with the contract documents.

Owner	Signature	Date
-------	-----------	------

Note: Authority cited: Section 65594, Gov. Code. Reference: Section 65597, Gov. Code.

(d) Public Education

(1) Publications.

(A) Local agencies shall provide information to owners of all new, single family residential homes regarding the design, installation, and maintenance of water efficient landscapes.

(B) Information about the efficient use of landscape water shall be provided to water users throughout the community.

(2) Model Homes.

At least one model home that is landscaped in each project consisting of eight or more homes shall demonstrate via signs and information the principles of water efficient landscapes described in this ordinance.

(A) Signs shall be used to identify the model as an example of a water efficient landscape and featuring elements such as hydrozones, irrigation equipment and others which contribute to the overall water efficient theme.

(B) Information shall be provided about designing, installing, and maintaining water efficient landscapes.

Note: Authority cited: Section 65594, Gov. Code. Reference: Section 65597.

493. PROVISIONS FOR EXISTING LANDSCAPES.

(a) Water Management

All existing landscaped areas to which the city or county provides water that are one acre or more, including golf courses, green belts, common areas, multi-family housing, schools, businesses, parks, cemeteries, and publicly owned landscapes shall have a landscape irrigation audit at least every five years. At a minimum, the audit shall be in accordance with the California Landscape Water Management Program as described in the Landscape Irrigation Auditor Handbook, the entire document which is hereby incorporated by reference. (See Landscape Irrigation Auditor Handbook, Dept. of Water Resources, Water Conservation Office (June 1990) version 5.5.)

(1) If the project's water bills indicate that they are using less than or equal to the Maximum Applied Water Allowance for that project site, an audit shall not be required.

(2) Recognition of projects that stay within the Maximum Applied Water Allowance is encouraged.

(b) Water Waste Prevention

Cities and counties shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, or structures. Penalties for violation of these prohibitions shall be established locally.

(Authority cited: Section 65594, Gov. Code. Reference: Section 65597, Gov. Code.)

11
11

H. AMENDMENTS

JN 031491

HYDROLOGY REPORT
HYDROLOGY REPORT
for
TENTATIVE TRACT MAP
15323
Newport Beach, CA

Prepared For
Coastal Farms Real Estates, LLC
537 Newport Center Drive
Newport Beach, CA 92660

Prepared By
Adams-Streeter Civil Engineers Inc
15 Corporate Park
Irvine, CA 92606
949-474-2330

August, 2004
August, 2004

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25-Year Proposed Condition Hydrology Section 2

100-Year Existing Condition Hydrology Section 3

100-Year Proposed Condition Hydrology Section 4

Hydrology Maps Section 5

- Existing Condition Hydrology
- Proposed Condition Hydrology
- Reference Storm Drain Plans

Introduction

Tentative Tract Map 15323 will be developed to accommodate 19 custom residential lots and a community pool. The community will be gated with privately maintained streets and storm drain. Currently, this development is situated on the south side of Bayside Drive west of Jamboree Road which are apartments known as "The Newport Marina Apartments". The property entrance is off of Bayside Drive but also fronts the Promontory Bay to the west and North Bay Front to the south (with docks on the south side of the property). The entire south and west side of the property is elevated and is being retained by a sea wall (bulkhead). The adjacent site to the east is level with this property and is also developed as residential use.

Existing Conditions

The site seems to indicate a drainage pattern that may be split with the northern portion of the site draining towards Bayside Drive. These surface flows are picked up through the use of catch basins and inlets within the parking areas which drain to the 36" RCP that runs under the sidewalk along Bayside Drive. Bayside Drive's drainage pattern is towards the northwest, but the storm drain under the sidewalk bucks grade and connects a catch basin to the east. There are tributary areas within the northeast portion of this site that drain via surface flow out onto Bayside Drive directly. This run-off gets captured by the same basin mentioned above. This city maintained catch basin is situated on Bayside Drive at the northeast corner of the site. According to storm drain improvement plans obtained from city records (and enclosed in section 5), the drainage flows captured by this catch basin will drain via a 36" storm drain directly into North Bay Front. The outlet structure seems to be underwater year round.

The southern portion of the site is divided into 5 sections, of which each is collected via drains through a series of pipe network and eventually drains directly onto North Bay Front via outlets through the bulkhead (refer to Exhibit 3 and the Existing Condition Hydrology Map for location of outlets).

Developed Condition

The developed condition of this site will implement a privately maintained storm drain system. This system will consist of drop inlets, catch basins and 18" & 24" Reinforced Concrete Pipes (RCP) to convey storm run-off through the private street. Each new homeowner will be responsible to construct their own drainage system and connect to the storm drain stubs that will be provided. Each lot will be rough graded and will drain via surface flow into a drop inlet within the street gutter. These inlets will be constructed within a concrete gutter at the upstream section of each proposed driveway to minimize

nuisance flows. The inlets will be directly connected to the storm drain system within the private street. Any flows entering the private street will be captured by catch basins which will also be connected directly to the storm drain system. The entire site's runoff will be filtered by employing a "First Flow" filter system prior to its connection onto the public system. This storm drain system will eventually connect to the existing 36" RCP which runs parallel with the east property line and located within its own 20' easement.

Conclusions

The entire site's runoff will be filtered prior to its connection onto the public system. The undeveloped condition of the site (currently developed as apartments) contains approximately 80% Actual Impervious Cover; according to the Orange County Hydrology Manual Figure C-4 (included in this section). The proposed condition (Single Family Residential) will be developed with approximately 5 dwelling units per acre; which according to Figure C-4 equates to 50% Actual Impervious Cover. Ultimately, this 30% decrease in impervious cover will reduce the run-off with the development of this site.

ACTUAL IMPERVIOUS COVER

Land Use (1)	Range-Percent	Recommended Value For Average Conditions-Percent (2)
Natural or Agriculture	0 - 0	0
Public Park	10 - 25	15
School	30 - 50	40
Single Family Residential: (3)		
2.5 acre lots	5 - 15	10
1 acre lots	10 - 25	20
2 dwellings/acre	20 - 40	30
3-4 dwellings/acre	30 - 50	40
5-7 dwellings/acre	35 - 55	50
8-10 dwellings/acre	50 - 70	60
More than 10 dwellings/acre	65 - 90	80
Multiple Family Residential:		
Condominiums	45 - 70	65
Apartments	65 - 90	80
Mobile Home Park	60 - 85	75
Commercial, Downtown Business or Industrial	80 - 100	90

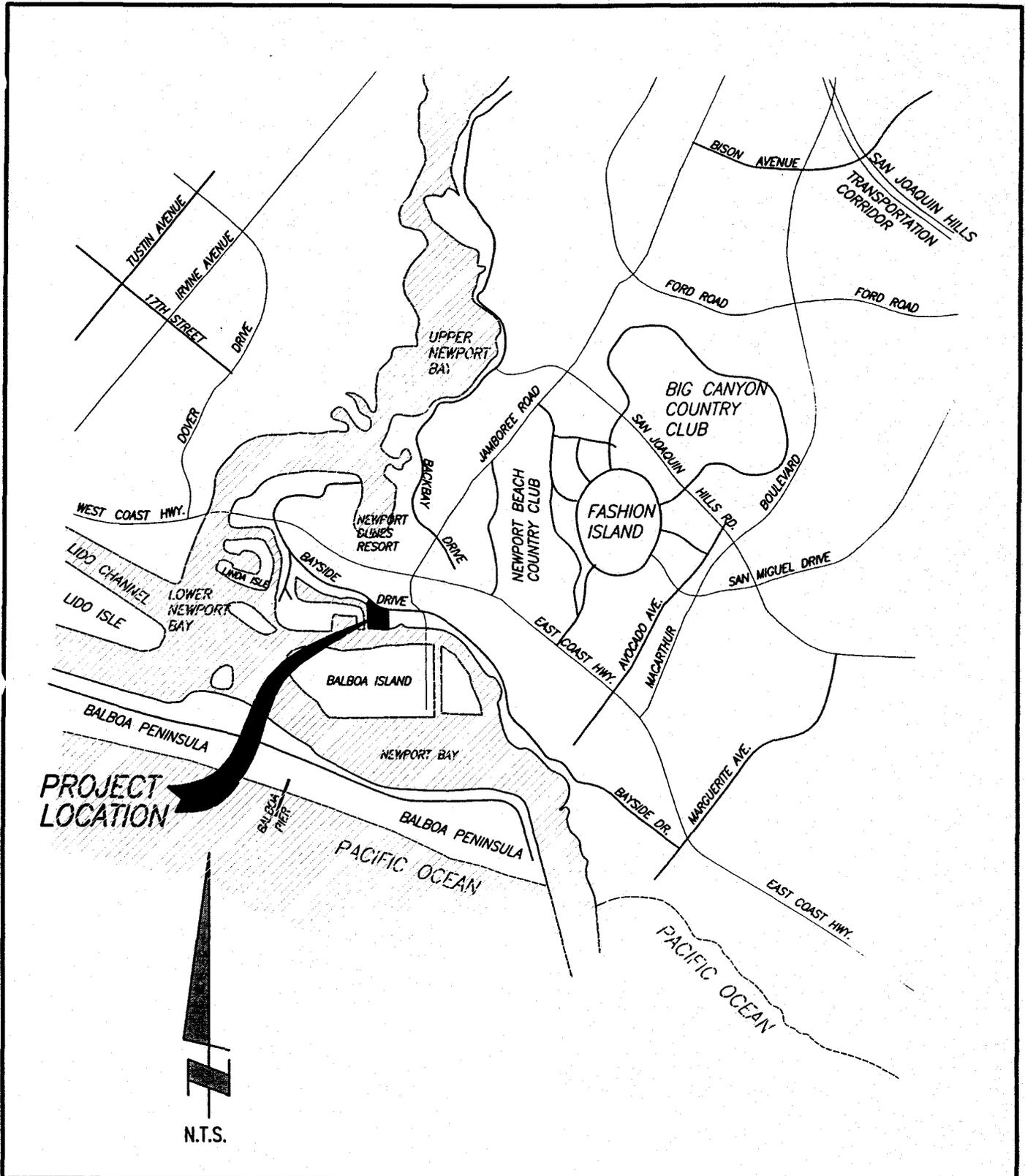
Notes:

1. Land use should be based on ultimate development of the watershed. Long range master plans for the County and incorporated cities should be reviewed to insure reasonable land use assumptions.
2. Recommended values are based on average conditions which may not apply to a particular study area. The percentage impervious may vary greatly even on comparable sized lots due to differences in dwelling size, improvements, etc. Landscape practices should also be considered as it is common in some areas to use ornamental gravels underlain by impervious plastic materials in place of lawns and shrubs. A field investigation of a study area shall always be made, and a review of aerial photos, where available, may assist in estimating the percentage of impervious cover in developed areas.
3. For typical equestrian subdivisions increase impervious area 5 percent over the values recommended in the table above.

**ORANGE COUNTY
HYDROLOGY MANUAL**

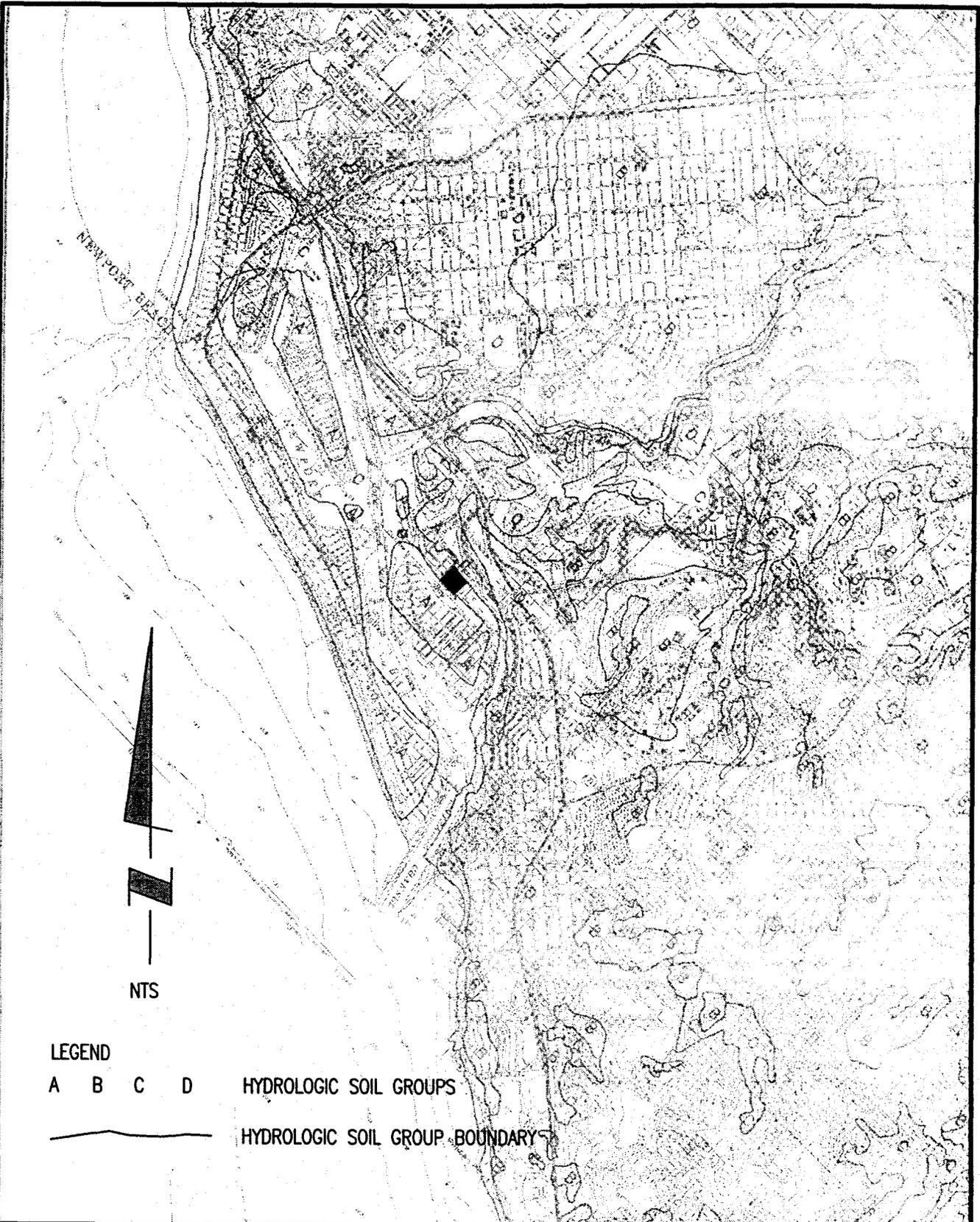
**ACTUAL IMPERVIOUS COVER
FOR
DEVELOPED AREAS**

Figure C-4



ADAMS • STREETER
CIVIL ENGINEERS, INC.
 15 Corporate Park, Irvine, CA 92606
 Ph: 949 474-2330 Fax: 949 474-0251

INDEX MAP
TTM 15323
CITY OF NEWPORT BEACH
EXHIBIT 1



LEGEND

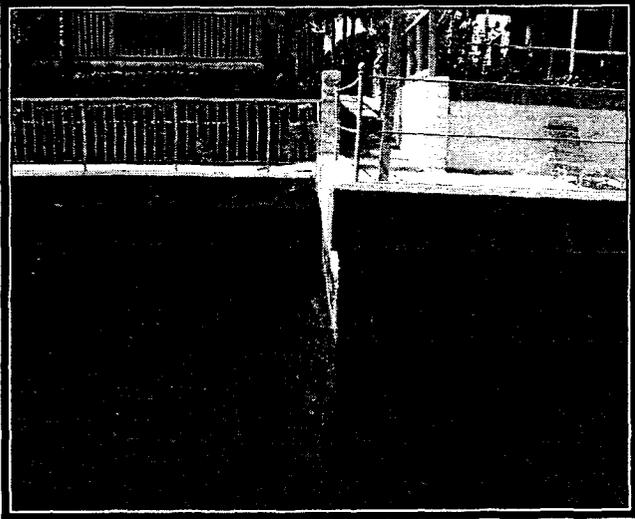
A B C D HYDROLOGIC SOIL GROUPS

— HYDROLOGIC SOIL GROUP BOUNDARY

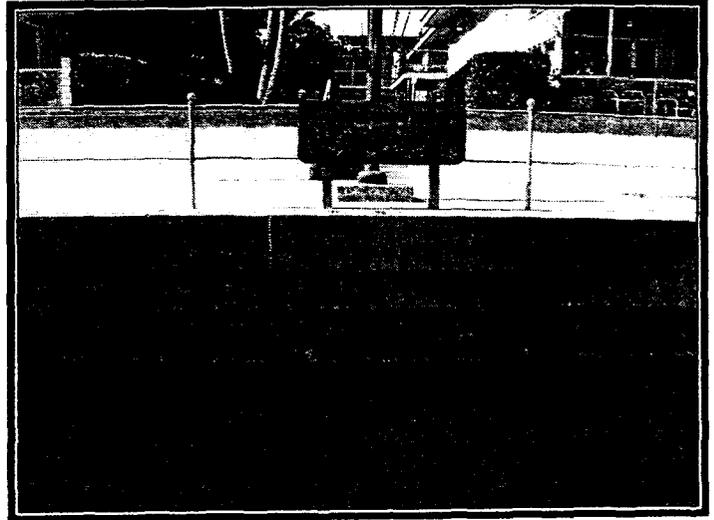


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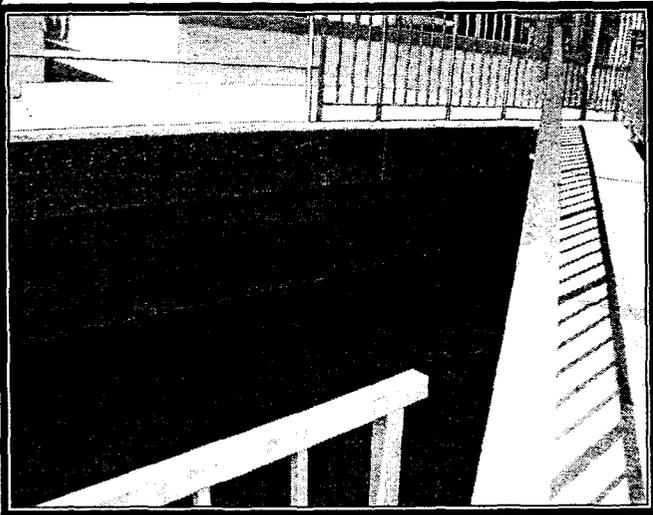
SOIL INDEX
TTM 15323
CITY OF NEWPORT BEACH
PLATE C



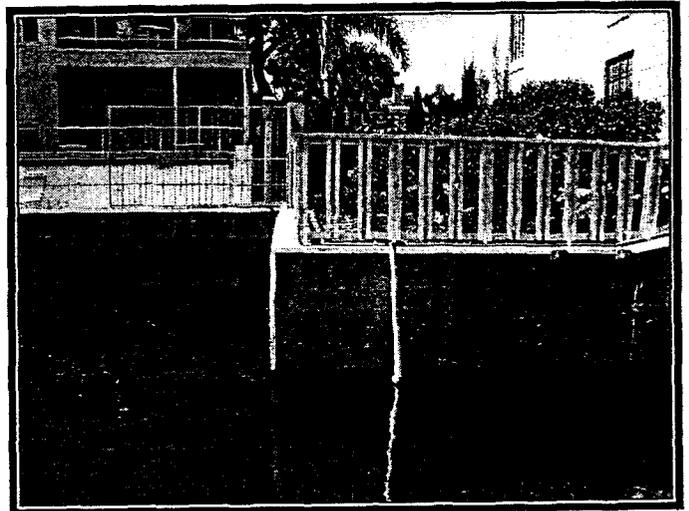
Outlet 1 & 2



Outlet 3



Outlet 4



Outlet 5

EXHIBIT 3

TTM 15323
Newport Beach, CA

Section 1
25-Year Existing Condition Hydrology

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE

(Reference: 1986 OCEMA HYDROLOGY CRITERION)

(c) Copyright 1983-2001 Advanced Engineering Software (aes)

Ver. 8.0 Release Date: 01/01/2001 License ID 1204

Analysis prepared by:

Adams-Streeter Civil Engineers, Inc
15 Corporate Park
Irvine, CA 92606
(949) 474-2330

***** DESCRIPTION OF STUDY *****

- * BAY HARBOR
* TENTATIVE TRACT MAP 15323
* 25-YR HYDROLOGY (EXISTING CONDITION)

FILE NAME: MARINAX.DAT
TIME/DATE OF STUDY: 15:13 08/27/2004

=====
USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

Table with columns: NO., HALF-WIDTH (FT), CROWN TO CROSSFALL (FT), STREET-CROSSFALL: IN-SIDE / OUT-SIDE / PARK-WAY, CURB HEIGHT (FT), GUTTER WIDTH (FT), GUTTER GEOMETRIES: LIP (FT), HIKE (FT), MANNING FACTOR (n). Row 1: 1, 30.0, 20.0, 0.018/0.018/0.020, 0.67, 2.00, 0.0312, 0.167, 0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- 1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====
INITIAL SUBAREA FLOW-LENGTH(FEET) = 190.00
ELEVATION DATA: UPSTREAM(FEET) = 15.90 DOWNSTREAM(FEET) = 14.90

$$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 7.547

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.821

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.52	0.40	0.20	32	7.55

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.75

TOTAL AREA(ACRES) = 0.52 PEAK FLOW RATE(CFS) = 1.75

FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 240.00

ELEVATION DATA: UPSTREAM(FEET) = 17.20 DOWNSTREAM(FEET) = 15.30

$$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 7.637

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.799

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.31	0.40	0.20	32	7.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.04

TOTAL AREA(ACRES) = 0.31 PEAK FLOW RATE(CFS) = 1.04

FLOW PROCESS FROM NODE 5.00 TO NODE 6.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 195.00

ELEVATION DATA: UPSTREAM(FEET) = 16.20 DOWNSTREAM(FEET) = 15.40

$$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 8.016

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.712

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.31	0.40	0.20	32	8.02

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.01

TOTAL AREA(ACRES) = 0.31 PEAK FLOW RATE(CFS) = 1.01

FLOW PROCESS FROM NODE 7.00 TO NODE 8.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 155.00
 ELEVATION DATA: UPSTREAM (FEET) = 16.80 DOWNSTREAM (FEET) = 15.70

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.553
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.205

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.27	0.40	0.20	32	6.55

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF (CFS) = 1.00

TOTAL AREA (ACRES) = 0.27 PEAK FLOW RATE (CFS) = 1.00

FLOW PROCESS FROM NODE 9.00 TO NODE 10.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 330.00
 ELEVATION DATA: UPSTREAM (FEET) = 16.50 DOWNSTREAM (FEET) = 8.30

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.901
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.067

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.52	0.40	0.20	32	6.90

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF (CFS) = 1.87

TOTAL AREA (ACRES) = 0.52 PEAK FLOW RATE (CFS) = 1.87

FLOW PROCESS FROM NODE 11.00 TO NODE 12.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 210.00
 ELEVATION DATA: UPSTREAM (FEET) = 15.70 DOWNSTREAM (FEET) = 8.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$
 SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.385
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.667

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.36	0.40	0.20	32	5.39

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.49
TOTAL AREA(ACRES) = 0.36 PEAK FLOW RATE(CFS) = 1.49

FLOW PROCESS FROM NODE 13.00 TO NODE 14.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 210.00
ELEVATION DATA: UPSTREAM(FEET) = 15.70 DOWNSTREAM(FEET) = 9.10

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**} 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.495

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.624

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.39	0.40	0.20	32	5.50

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.59

TOTAL AREA(ACRES) = 0.39 PEAK FLOW RATE(CFS) = 1.59

FLOW PROCESS FROM NODE 15.00 TO NODE 16.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 220.00
ELEVATION DATA: UPSTREAM(FEET) = 15.70 DOWNSTREAM(FEET) = 9.10

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**} 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.651

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.562

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.41	0.40	0.20	32	5.65

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.65

TOTAL AREA(ACRES) = 0.41 PEAK FLOW RATE(CFS) = 1.65

FLOW PROCESS FROM NODE 17.00 TO NODE 18.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 220.00
ELEVATION DATA: UPSTREAM(FEET) = 15.90 DOWNSTREAM(FEET) = 8.40

$T_c = K * [(LENGTH^{**} 3.00) / (ELEVATION CHANGE)]^{**} 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.508

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.619

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	A	0.50	0.40	0.20	32	5.51

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.20
SUBAREA RUNOFF(CFS) = 2.04
TOTAL AREA(ACRES) = 0.50 PEAK FLOW RATE(CFS) = 2.04

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 0.50 TC(MIN.) = 5.51
EFFECTIVE AREA(ACRES) = 0.50 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.20
PEAK FLOW RATE(CFS) = 2.04

END OF RATIONAL METHOD ANALYSIS

TTM 15323
Newport Beach, CA

Section 2
25-Year Proposed Condition Hydrology

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 OCEMA HYDROLOGY CRITERION)
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Analysis prepared by:

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Irvine, CA 92606
(949) 474-2330

***** DESCRIPTION OF STUDY *****

* BAY HARBOR *
* TENTATIVE TRACT MAP 15323 *
* 25-YR HYDROLOGY (PROPOSED CONDITION) *

FILE NAME: MARINA.DAT
TIME/DATE OF STUDY: 11:46 08/26/2004

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH (FT)	LIP (FT)	HIKE (FT)	MANNING FACTOR (n)
1	18.0	12.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0150
2	13.0	8.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0170

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 1.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 227.00
ELEVATION DATA: UPSTREAM(FEET) = 17.50 DOWNSTREAM(FEET) = 14.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.848

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.737

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	A	0.19	0.40	0.50	32	7.85

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA RUNOFF(CFS) = 0.60
TOTAL AREA(ACRES) = 0.19 PEAK FLOW RATE(CFS) = 0.60

FLOW PROCESS FROM NODE 2.00 TO NODE 3.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 2 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 14.00 DOWNSTREAM ELEVATION(FEET) = 13.20
STREET LENGTH(FEET) = 100.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 13.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 8.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0170
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.41
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.30
HALFSTREET FLOOD WIDTH(FEET) = 8.59
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.65
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.49
STREET FLOW TRAVEL TIME(MIN.) = 1.01 Tc(MIN.) = 8.86
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.520

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.54	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.54 SUBAREA RUNOFF(CFS) = 1.61
EFFECTIVE AREA(ACRES) = 0.73 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.73 PEAK FLOW RATE(CFS) = 2.18

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.33 HALFSTREET FLOOD WIDTH(FEET) = 10.41
FLOW VELOCITY(FEET/SEC.) = 1.82 DEPTH*VELOCITY(FT*FT/SEC.) = 0.61
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 327.00 FEET.

FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 6.20 DOWNSTREAM(FEET) = 3.21
FLOW LENGTH(FEET) = 167.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.67
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.18
PIPE TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 9.35
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 494.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

FLOW PROCESS FROM NODE 5.00 TO NODE 6.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 138.00
ELEVATION DATA: UPSTREAM(FEET) = 15.00 DOWNSTREAM(FEET) = 13.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.511

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.222

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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RESIDENTIAL

"5-7 DWELLINGS/ACRE" A 0.16 0.40 0.50 32 6.51

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.58

TOTAL AREA(ACRES) = 0.16 PEAK FLOW RATE(CFS) = 0.58

FLOW PROCESS FROM NODE 6.00 TO NODE 7.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) = 13.00 DOWNSTREAM ELEVATION(FEET) = 11.00
STREET LENGTH(FEET) = 110.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.22

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.25

HALFSTREET FLOOD WIDTH(FEET) = 6.23

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.40

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.60

STREET FLOW TRAVEL TIME(MIN.) = 0.76 Tc(MIN.) = 7.28

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.919

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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RESIDENTIAL

"5-7 DWELLINGS/ACRE" A 0.38 0.40 0.50 32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA AREA(ACRES) = 0.38 SUBAREA RUNOFF(CFS) = 1.27

EFFECTIVE AREA(ACRES) = 0.54 AREA-AVERAGED Fm(INCH/HR) = 0.20

AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50

TOTAL AREA(ACRES) = 0.54 PEAK FLOW RATE(CFS) = 1.81

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.28 HALFSTREET FLOOD WIDTH(FEET) = 7.55

FLOW VELOCITY(FEET/SEC.) = 2.63 DEPTH*VELOCITY(FT*FT/SEC.) = 0.73

LONGEST FLOWPATH FROM NODE 5.00 TO NODE 7.00 = 248.00 FEET.

FLOW PROCESS FROM NODE 7.00 TO NODE 4.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 4.00 DOWNSTREAM(FEET) = 3.21

FLOW LENGTH(FEET) = 26.00 MANNING'S N = 0.013

ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000

DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.9 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 6.48

ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 1.81

PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 7.34

LONGEST FLOWPATH FROM NODE 5.00 TO NODE 4.00 = 274.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
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1 1.81 7.34 3.892 0.40(0.20) 0.50 0.5 5.00
 LONGEST FLOWPATH FROM NODE 5.00 TO NODE 4.00 = 274.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.18	9.35	3.408	0.40(0.20)	0.50	0.7	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 494.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.78	7.34	3.892	0.40(0.20)	0.50	1.1	5.00
2	3.75	9.35	3.408	0.40(0.20)	0.50	1.3	1.00

TOTAL AREA (ACRES) = 1.27

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3.78 Tc(MIN.) = 7.342
 EFFECTIVE AREA(ACRES) = 1.11 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 1.27
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 494.00 FEET.

 FLOW PROCESS FROM NODE 4.00 TO NODE 8.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3.21 DOWNSTREAM(FEET) = 2.85
 FLOW LENGTH(FEET) = 20.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.64
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 3.78
 PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 7.39
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 8.00 = 514.00 FEET.

 FLOW PROCESS FROM NODE 8.00 TO NODE 8.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

 FLOW PROCESS FROM NODE 9.00 TO NODE 10.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 145.00
 ELEVATION DATA: UPSTREAM(FEET) = 13.00 DOWNSTREAM(FEET) = 11.10

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.777
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.116

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	A	0.14	0.40	0.50	32	6.78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA RUNOFF(CFS) = 0.49
TOTAL AREA(ACRES) = 0.14 PEAK FLOW RATE(CFS) = 0.49

FLOW PROCESS FROM NODE 10.00 TO NODE 11.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 11.10 DOWNSTREAM ELEVATION(FEET) = 10.40
STREET LENGTH(FEET) = 100.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 13.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 8.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0170
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.29
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.30
HALFSTREET FLOOD WIDTH(FEET) = 8.53
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.53
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.45
STREET FLOW TRAVEL TIME(MIN.) = 1.09 Tc(MIN.) = 7.87
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.746

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.50	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 1.60
EFFECTIVE AREA(ACRES) = 0.64 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.64 PEAK FLOW RATE(CFS) = 2.04

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.33 HALFSTREET FLOOD WIDTH(FEET) = 10.41
FLOW VELOCITY(FEET/SEC.) = 1.70 DEPTH*VELOCITY(FT*FT/SEC.) = 0.57
LONGEST FLOWPATH FROM NODE 9.00 TO NODE 11.00 = 245.00 FEET.

FLOW PROCESS FROM NODE 11.00 TO NODE 8.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3.40 DOWNSTREAM(FEET) = 2.85
FLOW LENGTH(FEET) = 110.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 6.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.52
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.04
PIPE TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 8.39
LONGEST FLOWPATH FROM NODE 9.00 TO NODE 8.00 = 355.00 FEET.

FLOW PROCESS FROM NODE 8.00 TO NODE 8.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.04	8.39	3.627	0.40(0.20)	0.50	0.6	9.00
LONGEST FLOWPATH FROM NODE 9.00 TO NODE 8.00 =					355.00 FEET.		

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.78	7.39	3.873	0.40(0.20)	0.50	1.1	5.00
2	3.75	9.40	3.397	0.40(0.20)	0.50	1.3	1.00
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 8.00 =					514.00 FEET.		

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.71	7.39	3.873	0.40(0.20)	0.50	1.7	5.00
2	5.81	8.39	3.627	0.40(0.20)	0.50	1.8	9.00
3	5.66	9.40	3.397	0.40(0.20)	0.50	1.9	1.00
TOTAL AREA(ACRES) =					1.91		

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5.81 Tc(MIN.) = 8.388
EFFECTIVE AREA(ACRES) = 1.83 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 1.91
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 8.00 = 514.00 FEET.

FLOW PROCESS FROM NODE 8.00 TO NODE 12.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2.85 DOWNSTREAM(FEET) = 2.73
FLOW LENGTH(FEET) = 24.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.55

ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 5.81
 PIPE TRAVEL TIME(MIN.) = 0.09 Tc(MIN.) = 8.48
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 12.00 = 538.00 FEET.

 FLOW PROCESS FROM NODE 12.00 TO NODE 12.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<

 FLOW PROCESS FROM NODE 13.00 TO NODE 14.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 115.00
 ELEVATION DATA: UPSTREAM(FEET) = 14.50 DOWNSTREAM(FEET) = 11.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.280
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.709
 SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.08	0.40	0.50	32	5.28

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
 SUBAREA RUNOFF(CFS) = 0.32
 TOTAL AREA(ACRES) = 0.08 PEAK FLOW RATE(CFS) = 0.32

 FLOW PROCESS FROM NODE 14.00 TO NODE 14.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 5.28
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.709
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.03	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
 SUBAREA AREA(ACRES) = 0.03 SUBAREA RUNOFF(CFS) = 0.12
 EFFECTIVE AREA(ACRES) = 0.11 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 0.11 PEAK FLOW RATE(CFS) = 0.45

 FLOW PROCESS FROM NODE 14.00 TO NODE 12.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

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=====
ELEVATION DATA: UPSTREAM(FEET) = 4.20 DOWNSTREAM(FEET) = 2.73
FLOW LENGTH(FEET) = 19.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 1.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.94
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.45
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 5.33
LONGEST FLOWPATH FROM NODE 13.00 TO NODE 12.00 = 134.00 FEET.

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FLOW PROCESS FROM NODE 12.00 TO NODE 12.00 IS CODE = 11
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>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	0.45	5.33	4.688	0.40(0.20)	0.50	0.1	13.00

LONGEST FLOWPATH FROM NODE 13.00 TO NODE 12.00 = 134.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.71	7.48	3.838	0.40(0.20)	0.50	1.7	5.00
2	5.81	8.48	3.607	0.40(0.20)	0.50	1.8	9.00
3	5.66	9.49	3.377	0.40(0.20)	0.50	1.9	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 12.00 = 538.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.47	5.33	4.688	0.40(0.20)	0.50	1.3	13.00
2	6.07	7.48	3.838	0.40(0.20)	0.50	1.8	5.00
3	6.15	8.48	3.607	0.40(0.20)	0.50	1.9	9.00
4	5.97	9.49	3.377	0.40(0.20)	0.50	2.0	1.00

TOTAL AREA(ACRES) = 2.02

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 6.15 Tc(MIN.) = 8.476
EFFECTIVE AREA(ACRES) = 1.94 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 2.02
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 12.00 = 538.00 FEET.

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*****
FLOW PROCESS FROM NODE 0.00 TO NODE 0.00 IS CODE = 12
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>>>>>CLEAR MEMORY BANK # 1 <<<<<
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*****
FLOW PROCESS FROM NODE 0.00 TO NODE 0.00 IS CODE = 12
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>>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 0.00 TO NODE 0.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

FLOW PROCESS FROM NODE 12.00 TO NODE 15.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2.73 DOWNSTREAM(FEET) = 2.00
FLOW LENGTH(FEET) = 145.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 18.0 INCH PIPE IS 12.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.61
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 6.15
PIPE TRAVEL TIME(MIN.) = 0.52 Tc(MIN.) = 9.00
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 15.00 = 683.00 FEET.

FLOW PROCESS FROM NODE 15.00 TO NODE 15.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

FLOW PROCESS FROM NODE 16.00 TO NODE 17.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 170.00
ELEVATION DATA: UPSTREAM(FEET) = 16.50 DOWNSTREAM(FEET) = 14.20

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.176

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.958

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.17	0.40	0.50	32	7.18

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.58

TOTAL AREA(ACRES) = 0.17 PEAK FLOW RATE(CFS) = 0.58

FLOW PROCESS FROM NODE 17.00 TO NODE 17.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 7.18

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.958

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.10	0.40	0.50	32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50					
SUBAREA AREA(ACRES) = 0.10		SUBAREA RUNOFF(CFS) =		0.34	
EFFECTIVE AREA(ACRES) = 0.27		AREA-AVERAGED Fm(INCH/HR) =		0.20	
AREA-AVERAGED Fp(INCH/HR) = 0.40		AREA-AVERAGED Ap =		0.50	
TOTAL AREA(ACRES) = 0.27		PEAK FLOW RATE(CFS) =		0.91	

FLOW PROCESS FROM NODE 17.00 TO NODE 18.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 7.20 DOWNSTREAM(FEET) = 3.00
FLOW LENGTH(FEET) = 134.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.36
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.91
PIPE TRAVEL TIME(MIN.) = 0.42 Tc(MIN.) = 7.59
LONGEST FLOWPATH FROM NODE 16.00 TO NODE 18.00 = 304.00 FEET.

FLOW PROCESS FROM NODE 18.00 TO NODE 18.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 19.00 TO NODE 20.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 146.00
ELEVATION DATA: UPSTREAM(FEET) = 15.00 DOWNSTREAM(FEET) = 14.30

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.309
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.646

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	A	0.15	0.40	0.50	32	8.31
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50						
SUBAREA RUNOFF(CFS) = 0.47						
TOTAL AREA(ACRES) = 0.15 PEAK FLOW RATE(CFS) = 0.47						

FLOW PROCESS FROM NODE 20.00 TO NODE 21.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<
=====

UPSTREAM ELEVATION(FEET) = 14.30 DOWNSTREAM ELEVATION(FEET) = 11.00
STREET LENGTH(FEET) = 130.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.73
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.21
HALFSTREET FLOOD WIDTH(FEET) = 4.07
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.57
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.53
STREET FLOW TRAVEL TIME(MIN.) = 0.84 Tc(MIN.) = 9.15
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.453

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.18	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.18 SUBAREA RUNOFF(CFS) = 0.53
EFFECTIVE AREA(ACRES) = 0.33 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.33 PEAK FLOW RATE(CFS) = 0.97

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.22 HALFSTREET FLOOD WIDTH(FEET) = 4.91
FLOW VELOCITY(FEET/SEC.) = 2.69 DEPTH*VELOCITY(FT*FT/SEC.) = 0.60
LONGEST FLOWPATH FROM NODE 19.00 TO NODE 21.00 = 276.00 FEET.

FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
=====

MAINLINE Tc(MIN) = 9.15

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.453

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.05	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
 SUBAREA AREA(ACRES) = 0.05 SUBAREA RUNOFF(CFS) = 0.15
 EFFECTIVE AREA(ACRES) = 0.38 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 0.38 PEAK FLOW RATE(CFS) = 1.11

 FLOW PROCESS FROM NODE 21.00 TO NODE 18.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 4.00 DOWNSTREAM(FEET) = 3.00
 FLOW LENGTH(FEET) = 25.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.20
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.11
 PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 9.22
 LONGEST FLOWPATH FROM NODE 19.00 TO NODE 18.00 = 301.00 FEET.

 FLOW PROCESS FROM NODE 18.00 TO NODE 18.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.11	9.22	3.438	0.40(0.20)	0.50	0.4	19.00
LONGEST FLOWPATH FROM NODE 19.00 TO NODE 18.00 = 301.00 FEET.							

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	0.91	7.59	3.809	0.40(0.20)	0.50	0.3	16.00
LONGEST FLOWPATH FROM NODE 16.00 TO NODE 18.00 = 304.00 FEET.							

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.93	7.59	3.809	0.40(0.20)	0.50	0.6	16.00
2	1.93	9.22	3.438	0.40(0.20)	0.50	0.7	19.00
TOTAL AREA(ACRES) = 0.65							

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1.93 Tc(MIN.) = 7.593
 EFFECTIVE AREA(ACRES) = 0.58 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 0.65
 LONGEST FLOWPATH FROM NODE 16.00 TO NODE 18.00 = 304.00 FEET.

 FLOW PROCESS FROM NODE 18.00 TO NODE 15.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3.00 DOWNSTREAM(FEET) = 2.00
 FLOW LENGTH(FEET) = 32.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.67
 ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 1.93
 PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 7.67
 LONGEST FLOWPATH FROM NODE 16.00 TO NODE 15.00 = 336.00 FEET.

 FLOW PROCESS FROM NODE 15.00 TO NODE 15.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.93	7.67	3.791	0.40(0.20)	0.50	0.6	16.00
2	1.93	9.30	3.420	0.40(0.20)	0.50	0.7	19.00

LONGEST FLOWPATH FROM NODE 16.00 TO NODE 15.00 = 336.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.47	5.87	4.476	0.40(0.20)	0.50	1.3	13.00
2	6.07	8.01	3.715	0.40(0.20)	0.50	1.8	5.00
3	6.15	9.00	3.488	0.40(0.20)	0.50	1.9	9.00
4	5.97	10.02	3.258	0.40(0.20)	0.50	2.0	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 15.00 = 683.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.23	5.87	4.476	0.40(0.20)	0.50	1.8	13.00
2	7.91	7.67	3.791	0.40(0.20)	0.50	2.3	16.00
3	8.00	8.01	3.715	0.40(0.20)	0.50	2.4	5.00
4	8.08	9.00	3.488	0.40(0.20)	0.50	2.6	9.00
5	8.03	9.30	3.420	0.40(0.20)	0.50	2.6	19.00
6	7.81	10.02	3.258	0.40(0.20)	0.50	2.7	1.00

TOTAL AREA(ACRES) = 2.67

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 8.08 Tc(MIN.) = 9.000
 EFFECTIVE AREA(ACRES) = 2.58 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 2.67
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 15.00 = 683.00 FEET.

 FLOW PROCESS FROM NODE 15.00 TO NODE 22.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2.00 DOWNSTREAM(FEET) = 1.85
FLOW LENGTH(FEET) = 31.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 12.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.94
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.08
PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 9.10
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 22.00 = 714.00 FEET.

FLOW PROCESS FROM NODE 22.00 TO NODE 22.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<

FLOW PROCESS FROM NODE 23.00 TO NODE 24.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 153.00
ELEVATION DATA: UPSTREAM(FEET) = 13.00 DOWNSTREAM(FEET) = 11.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.243

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.932

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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RESIDENTIAL

"5-7 DWELLINGS/ACRE"	A	0.14	0.40	0.50	32	7.24
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.47

TOTAL AREA(ACRES) = 0.14 PEAK FLOW RATE(CFS) = 0.47

FLOW PROCESS FROM NODE 24.00 TO NODE 25.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<

UPSTREAM ELEVATION(FEET) = 11.40 DOWNSTREAM ELEVATION(FEET) = 10.40
STREET LENGTH(FEET) = 138.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.29
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.29
 HALFSTREET FLOOD WIDTH(FEET) = 8.02
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.70
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.49
 STREET FLOW TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 8.60
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.580

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.54	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
 SUBAREA AREA(ACRES) = 0.54 SUBAREA RUNOFF(CFS) = 1.64
 EFFECTIVE AREA(ACRES) = 0.68 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 0.68 PEAK FLOW RATE(CFS) = 2.07

END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.32 HALFSTREET FLOOD WIDTH(FEET) = 9.89
 FLOW VELOCITY(FEET/SEC.) = 1.89 DEPTH*VELOCITY(FT*FT/SEC.) = 0.61
 LONGEST FLOWPATH FROM NODE 23.00 TO NODE 25.00 = 291.00 FEET.

 FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<

 FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

 FLOW PROCESS FROM NODE 26.00 TO NODE 27.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 168.00
 ELEVATION DATA: UPSTREAM(FEET) = 16.80 DOWNSTREAM(FEET) = 13.80

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.756
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 4.124

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.15	0.40	0.50	32	6.76

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.53
 TOTAL AREA(ACRES) = 0.15 PEAK FLOW RATE(CFS) = 0.53

FLOW PROCESS FROM NODE 27.00 TO NODE 25.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 13.80 DOWNSTREAM ELEVATION(FEET) = 10.40
 STREET LENGTH(FEET) = 124.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.05
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.23
 HALFSTREET FLOOD WIDTH(FEET) = 5.05
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.82
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.64
 STREET FLOW TRAVEL TIME(MIN.) = 0.73 Tc(MIN.) = 7.49
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.834

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.32	0.40	0.50	32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50					
SUBAREA AREA(ACRES) = 0.32 SUBAREA RUNOFF(CFS) = 1.05					
EFFECTIVE AREA(ACRES) = 0.47 AREA-AVERAGED Fm(INCH/HR) = 0.20					
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50					
TOTAL AREA(ACRES) = 0.47 PEAK FLOW RATE(CFS) = 1.54					

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.25 HALFSTREET FLOOD WIDTH(FEET) = 6.33
 FLOW VELOCITY(FEET/SEC.) = 2.96 DEPTH*VELOCITY(FT*FT/SEC.) = 0.75
 LONGEST FLOWPATH FROM NODE 26.00 TO NODE 25.00 = 292.00 FEET.

FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	1.54	7.49	3.834	0.40(0.20)	0.50	0.5	26.00

LONGEST FLOWPATH FROM NODE 26.00 TO NODE 25.00 = 292.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.07	8.60	3.580	0.40(0.20)	0.50	0.7	23.00

LONGEST FLOWPATH FROM NODE 23.00 TO NODE 25.00 = 291.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.48	7.49	3.834	0.40(0.20)	0.50	1.1	26.00
2	3.50	8.60	3.580	0.40(0.20)	0.50	1.1	23.00
TOTAL AREA(ACRES) =			1.15				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 3.50 Tc(MIN.) = 8.596
EFFECTIVE AREA(ACRES) = 1.15 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 1.15
LONGEST FLOWPATH FROM NODE 26.00 TO NODE 25.00 = 292.00 FEET.

FLOW PROCESS FROM NODE 25.00 TO NODE 22.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=====

ELEVATION DATA: UPSTREAM(FEET) = 5.40 DOWNSTREAM(FEET) = 1.85
FLOW LENGTH(FEET) = 5.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 23.90
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 3.50
PIPE TRAVEL TIME(MIN.) = 0.00 Tc(MIN.) = 8.60
LONGEST FLOWPATH FROM NODE 26.00 TO NODE 22.00 = 297.00 FEET.

FLOW PROCESS FROM NODE 22.00 TO NODE 22.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
=====

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.48	7.49	3.833	0.40(0.20)	0.50	1.1	26.00
2	3.50	8.60	3.579	0.40(0.20)	0.50	1.1	23.00

LONGEST FLOWPATH FROM NODE 26.00 TO NODE 22.00 = 297.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.23	5.98	4.433	0.40(0.20)	0.50	1.8	13.00
2	7.91	7.78	3.767	0.40(0.20)	0.50	2.3	16.00
3	8.00	8.11	3.691	0.40(0.20)	0.50	2.4	5.00

4	8.08	9.10	3.464	0.40(0.20)	0.50	2.6	9.00
5	8.03	9.40	3.396	0.40(0.20)	0.50	2.6	19.00
6	7.81	10.12	3.241	0.40(0.20)	0.50	2.7	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 22.00 = 714.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.46	5.98	4.433	0.40(0.20)	0.50	2.6	13.00
2	11.28	7.49	3.833	0.40(0.20)	0.50	3.3	26.00
3	11.39	7.78	3.767	0.40(0.20)	0.50	3.4	16.00
4	11.49	8.11	3.691	0.40(0.20)	0.50	3.5	5.00
5	11.54	8.60	3.579	0.40(0.20)	0.50	3.6	23.00
6	11.46	9.10	3.464	0.40(0.20)	0.50	3.7	9.00
7	11.34	9.40	3.396	0.40(0.20)	0.50	3.8	19.00
8	10.96	10.12	3.241	0.40(0.20)	0.50	3.8	1.00

TOTAL AREA (ACRES) = 3.82

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 11.54 Tc (MIN.) = 8.600
 EFFECTIVE AREA (ACRES) = 3.63 AREA-AVERAGED Fm (INCH/HR) = 0.20
 AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 3.82
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 22.00 = 714.00 FEET.

 FLOW PROCESS FROM NODE 22.00 TO NODE 28.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 1.85 DOWNSTREAM (FEET) = 0.95
 FLOW LENGTH (FEET) = 45.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 10.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.17
 GIVEN PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 11.54
 PIPE TRAVEL TIME (MIN.) = 0.08 Tc (MIN.) = 8.68
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 27.00 = 759.00 FEET.

 FLOW PROCESS FROM NODE 28.00 TO NODE 29.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 0.95 DOWNSTREAM (FEET) = 0.00
 FLOW LENGTH (FEET) = 32.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 9.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.59
 GIVEN PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 11.54
 PIPE TRAVEL TIME (MIN.) = 0.05 Tc (MIN.) = 8.73
 LONGEST FLOWPATH FROM NODE 1.00 TO NODE 28.00 = 791.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 3.82 TC (MIN.) = 8.73

EFFECTIVE AREA (ACRES) = 3.63 AREA-AVERAGED Fm (INCH/HR) = 0.20
 AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 PEAK FLOW RATE (CFS) = 11.54

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp (Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.46	6.11	4.380	0.40 (0.20)	0.50	2.6	13.00
2	11.28	7.63	3.801	0.40 (0.20)	0.50	3.3	26.00
3	11.39	7.91	3.736	0.40 (0.20)	0.50	3.4	16.00
4	11.49	8.24	3.661	0.40 (0.20)	0.50	3.5	5.00
5	11.54	8.73	3.549	0.40 (0.20)	0.50	3.6	23.00
6	11.46	9.24	3.434	0.40 (0.20)	0.50	3.7	9.00
7	11.34	9.54	3.366	0.40 (0.20)	0.50	3.8	19.00
8	10.96	10.25	3.220	0.40 (0.20)	0.50	3.8	1.00

=====
 END OF RATIONAL METHOD ANALYSIS

TTM 15323
Newport Beach, CA

Section 3
100-Year Existing Condition Hydrology

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 OCEMA HYDROLOGY CRITERION)
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Analysis prepared by:

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***** DESCRIPTION OF STUDY *****
* BAY HARBOR *
* TENTATIVE TRACT MAP 15323 *
* 100-YR HYDROLOGY (EXISTING CONDITION) *

FILE NAME: MARINAX.DAT
TIME/DATE OF STUDY: 15:17 08/27/2004

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

---*TIME-OF-CONCENTRATION MODEL*---

USER SPECIFIED STORM EVENT (YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE (INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL: IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES: WIDTH LIP HIKE (FT) (FT) (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00 0.0312 0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
1. Relative Flow-Depth = 0.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)
*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 190.00
ELEVATION DATA: UPSTREAM (FEET) = 15.90 DOWNSTREAM (FEET) = 14.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.547

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.887

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	A	0.52	0.40	0.20	32	7.55

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.20

SUBAREA RUNOFF(CFS) = 2.25

TOTAL AREA(ACRES) = 0.52 PEAK FLOW RATE(CFS) = 2.25

 FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 240.00

ELEVATION DATA: UPSTREAM(FEET) = 17.20 DOWNSTREAM(FEET) = 15.30

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.637

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.859

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	A	0.31	0.40	0.20	32	7.64

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.20

SUBAREA RUNOFF(CFS) = 1.33

TOTAL AREA(ACRES) = 0.31 PEAK FLOW RATE(CFS) = 1.33

 FLOW PROCESS FROM NODE 5.00 TO NODE 6.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 195.00

ELEVATION DATA: UPSTREAM(FEET) = 16.20 DOWNSTREAM(FEET) = 15.40

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.016

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.747

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	A	0.31	0.40	0.20	32	8.02

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.20

SUBAREA RUNOFF(CFS) = 1.30

TOTAL AREA(ACRES) = 0.31 PEAK FLOW RATE(CFS) = 1.30

 FLOW PROCESS FROM NODE 7.00 TO NODE 8.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 155.00
ELEVATION DATA: UPSTREAM (FEET) = 16.80 DOWNSTREAM (FEET) = 15.70

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.553

* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.388

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.27	0.40	0.20	32	6.55

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF (CFS) = 1.29

TOTAL AREA (ACRES) = 0.27 PEAK FLOW RATE (CFS) = 1.29

FLOW PROCESS FROM NODE 9.00 TO NODE 10.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 330.00
ELEVATION DATA: UPSTREAM (FEET) = 16.50 DOWNSTREAM (FEET) = 8.30

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 6.901

* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.209

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.52	0.40	0.20	32	6.90

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF (CFS) = 2.40

TOTAL AREA (ACRES) = 0.52 PEAK FLOW RATE (CFS) = 2.40

FLOW PROCESS FROM NODE 11.00 TO NODE 12.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 210.00
ELEVATION DATA: UPSTREAM (FEET) = 15.70 DOWNSTREAM (FEET) = 8.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.385

* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.991

SUBAREA T_c AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.36	0.40	0.20	32	5.39

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 1.92
TOTAL AREA(ACRES) = 0.36 PEAK FLOW RATE(CFS) = 1.92

FLOW PROCESS FROM NODE 13.00 TO NODE 14.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 210.00
ELEVATION DATA: UPSTREAM(FEET) = 15.70 DOWNSTREAM(FEET) = 9.10

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.495

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.935

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.39	0.40	0.20	32	5.50

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 2.05

TOTAL AREA(ACRES) = 0.39 PEAK FLOW RATE(CFS) = 2.05

FLOW PROCESS FROM NODE 15.00 TO NODE 16.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 220.00
ELEVATION DATA: UPSTREAM(FEET) = 15.70 DOWNSTREAM(FEET) = 9.10

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.651

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.854

SUBAREA T_c AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	F_p (INCH/HR)	A_p (DECIMAL)	SCS CN	T_c (MIN.)
APARTMENTS	A	0.41	0.40	0.20	32	5.65

SUBAREA AVERAGE PERVIOUS LOSS RATE, F_p (INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, A_p = 0.20

SUBAREA RUNOFF(CFS) = 2.13

TOTAL AREA(ACRES) = 0.41 PEAK FLOW RATE(CFS) = 2.13

FLOW PROCESS FROM NODE 17.00 TO NODE 18.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 220.00
ELEVATION DATA: UPSTREAM(FEET) = 15.90 DOWNSTREAM(FEET) = 8.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM T_c (MIN.) = 5.508

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.928

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	A	0.50	0.40	0.20	32	5.51

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.20

SUBAREA RUNOFF(CFS) = 2.63

TOTAL AREA(ACRES) = 0.50 PEAK FLOW RATE(CFS) = 2.63

=====
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 0.50 TC(MIN.) = 5.51
EFFECTIVE AREA(ACRES) = 0.50 AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.20
PEAK FLOW RATE(CFS) = 2.63
=====

=====
END OF RATIONAL METHOD ANALYSIS

TTM 15323
Newport Beach, CA

Section 4
100-Year Proposed Condition Hydrology

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 OCEMA HYDROLOGY CRITERION)
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Analysis prepared by:

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Irvine, CA 92606
(949) 474-2330

***** DESCRIPTION OF STUDY *****

- * BAY HARBOR *
- * TENTATIVE TRACT MAP 15323 *
- * 100-YR HYDROLOGY (PROPOSED CONDITION) *

FILE NAME: MARINA.DAT
TIME/DATE OF STUDY: 11:54 08/26/2004

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

=====

--*TIME-OF-CONCENTRATION MODEL*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
DATA BANK RAINFALL USED
ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD

USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL

NO.	HALF-	CROWN TO	STREET-CROSSFALL:			CURB	GUTTER-GEOMETRIES:			MANNING
	WIDTH	CROSSFALL	IN-	/	OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
	(FT)	(FT)	SIDE	/	SIDE/	(FT)	(FT)	(FT)	(FT)	(n)
1	18.0	12.0	0.020	/	0.020/0.020	0.50	1.50	0.0312	0.125	0.0150
2	13.0	8.0	0.020	/	0.020/0.020	0.50	1.50	0.0312	0.125	0.0170

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 1.00 FEET
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)

*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

FLOW PROCESS FROM NODE 1.00 TO NODE 2.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 227.00
ELEVATION DATA: UPSTREAM(FEET) = 17.50 DOWNSTREAM(FEET) = 14.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.848

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.779

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.19	0.40	0.50	32	7.848

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA RUNOFF(CFS) = 0.78
TOTAL AREA(ACRES) = 0.19 PEAK FLOW RATE(CFS) = 0.78

FLOW PROCESS FROM NODE 2.00 TO NODE 3.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 14.00 DOWNSTREAM ELEVATION(FEET) = 13.20
STREET LENGTH(FEET) = 100.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 13.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 8.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0170
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.83
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.32
HALFSTREET FLOOD WIDTH(FEET) = 9.66
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.74
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.56
STREET FLOW TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 8.80
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.514

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.54	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.54 SUBAREA RUNOFF(CFS) = 2.10
EFFECTIVE AREA(ACRES) = 0.73 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.73 PEAK FLOW RATE(CFS) = 2.83

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.36 HALFSTREET FLOOD WIDTH(FEET) = 11.66
FLOW VELOCITY(FEET/SEC.) = 1.92 DEPTH*VELOCITY(FT*FT/SEC.) = 0.69
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 3.00 = 327.00 FEET.

FLOW PROCESS FROM NODE 3.00 TO NODE 4.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) =	6.20	DOWNSTREAM(FEET) =	3.21
FLOW LENGTH(FEET) =	167.00	MANNING'S N =	0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO	18.000		
DEPTH OF FLOW IN 18.0 INCH PIPE IS	5.6 INCHES		
PIPE-FLOW VELOCITY(FEET/SEC.) =	6.10		
ESTIMATED PIPE DIAMETER(INCH) =	18.00	NUMBER OF PIPES =	1
PIPE-FLOW(CFS) =	2.83		
PIPE TRAVEL TIME(MIN.) =	0.46	Tc(MIN.) =	9.26
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 =	494.00 FEET.		

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

FLOW PROCESS FROM NODE 5.00 TO NODE 6.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH(FEET) =	138.00		
ELEVATION DATA: UPSTREAM(FEET) =	15.00	DOWNSTREAM(FEET) =	13.00

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.511

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.410

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.16	0.40	0.50	32	6.51
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.75

TOTAL AREA(ACRES) = 0.16 PEAK FLOW RATE(CFS) = 0.75

FLOW PROCESS FROM NODE 6.00 TO NODE 7.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<

=====

UPSTREAM ELEVATION(FEET) =	13.00	DOWNSTREAM ELEVATION(FEET) =	11.00
STREET LENGTH(FEET) =	110.00	CURB HEIGHT(INCHES) =	6.0
STREET HALFWIDTH(FEET) =	18.00		

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.58

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.27

HALFSTREET FLOOD WIDTH(FEET) = 7.08

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.55

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.68

STREET FLOW TRAVEL TIME(MIN.) = 0.72 Tc(MIN.) = 7.23

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.039

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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RESIDENTIAL

"5-7 DWELLINGS/ACRE"	A	0.38	0.40	0.50	32
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA AREA(ACRES) = 0.38 SUBAREA RUNOFF(CFS) = 1.65

EFFECTIVE AREA(ACRES) = 0.54 AREA-AVERAGED Fm(INCH/HR) = 0.20

AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50

TOTAL AREA(ACRES) = 0.54 PEAK FLOW RATE(CFS) = 2.35

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.30 HALFSTREET FLOOD WIDTH(FEET) = 8.48

FLOW VELOCITY(FEET/SEC.) = 2.81 DEPTH*VELOCITY(FT*FT/SEC.) = 0.83

LONGEST FLOWPATH FROM NODE 5.00 TO NODE 7.00 = 248.00 FEET.

FLOW PROCESS FROM NODE 7.00 TO NODE 4.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 4.00 DOWNSTREAM(FEET) = 3.21

FLOW LENGTH(FEET) = 26.00 MANNING'S N = 0.013

ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000

DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.4 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 7.00

ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1

PIPE-FLOW(CFS) = 2.35

PIPE TRAVEL TIME(MIN.) = 0.06 Tc(MIN.) = 7.29

LONGEST FLOWPATH FROM NODE 5.00 TO NODE 4.00 = 274.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 4.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
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1 2.35 7.29 5.007 0.40(0.20) 0.50 0.5 5.00
LONGEST FLOWPATH FROM NODE 5.00 TO NODE 4.00 = 274.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.83	9.26	4.379	0.40(0.20)	0.50	0.7	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 494.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.92	7.29	5.007	0.40(0.20)	0.50	1.1	5.00
2	4.88	9.26	4.379	0.40(0.20)	0.50	1.3	1.00

TOTAL AREA (ACRES) = 1.27

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4.92 Tc (MIN.) = 7.292
EFFECTIVE AREA (ACRES) = 1.11 AREA-AVERAGED Fm (INCH/HR) = 0.20
AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA (ACRES) = 1.27
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 4.00 = 494.00 FEET.

FLOW PROCESS FROM NODE 4.00 TO NODE 8.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 3.21 DOWNSTREAM (FEET) = 2.85
FLOW LENGTH (FEET) = 20.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.4 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 7.12
ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 4.92
PIPE TRAVEL TIME (MIN.) = 0.05 Tc (MIN.) = 7.34
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 8.00 = 514.00 FEET.

FLOW PROCESS FROM NODE 8.00 TO NODE 8.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 9.00 TO NODE 10.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

=====

INITIAL SUBAREA FLOW-LENGTH (FEET) = 145.00
ELEVATION DATA: UPSTREAM (FEET) = 13.00 DOWNSTREAM (FEET) = 11.10

Tc = K * [(LENGTH** 3.00) / (ELEVATION CHANGE)] ** 0.20
SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 6.777
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 5.273

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	A	0.14	0.40	0.50	32	6.78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA RUNOFF(CFS) = 0.64
TOTAL AREA(ACRES) = 0.14 PEAK FLOW RATE(CFS) = 0.64

FLOW PROCESS FROM NODE 10.00 TO NODE 11.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<<
>>>>(STREET TABLE SECTION # 2 USED)<<<<<<

=====

UPSTREAM ELEVATION(FEET) = 11.10 DOWNSTREAM ELEVATION(FEET) = 10.40
STREET LENGTH(FEET) = 100.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 13.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 8.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0170
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.68
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.32
HALFSTREET FLOOD WIDTH(FEET) = 9.59
AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.61
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.51
STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 7.81
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.809

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.50	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.50 SUBAREA RUNOFF(CFS) = 2.07
EFFECTIVE AREA(ACRES) = 0.64 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.64 PEAK FLOW RATE(CFS) = 2.65

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.36 HALFSTREET FLOOD WIDTH(FEET) = 11.66
FLOW VELOCITY(FEET/SEC.) = 1.80 DEPTH*VELOCITY(FT*FT/SEC.) = 0.65
LONGEST FLOWPATH FROM NODE 9.00 TO NODE 11.00 = 245.00 FEET.

FLOW PROCESS FROM NODE 11.00 TO NODE 8.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3.40 DOWNSTREAM(FEET) = 2.85
FLOW LENGTH(FEET) = 110.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 7.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.78
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.65
PIPE TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 8.29
LONGEST FLOWPATH FROM NODE 9.00 TO NODE 8.00 = 355.00 FEET.

FLOW PROCESS FROM NODE 8.00 TO NODE 8.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.65	8.29	4.665	0.40(0.20)	0.50	0.6	9.00
LONGEST FLOWPATH FROM NODE				9.00 TO NODE		8.00 =	355.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.92	7.34	4.983	0.40(0.20)	0.50	1.1	5.00
2	4.88	9.31	4.365	0.40(0.20)	0.50	1.3	1.00
LONGEST FLOWPATH FROM NODE				1.00 TO NODE		8.00 =	514.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.44	7.34	4.983	0.40(0.20)	0.50	1.7	5.00
2	7.55	8.29	4.665	0.40(0.20)	0.50	1.8	9.00
3	7.36	9.31	4.365	0.40(0.20)	0.50	1.9	1.00
TOTAL AREA(ACRES) =				1.91			

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 7.55 Tc(MIN.) = 8.294
EFFECTIVE AREA(ACRES) = 1.83 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 1.91
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 8.00 = 514.00 FEET.

FLOW PROCESS FROM NODE 8.00 TO NODE 12.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2.85 DOWNSTREAM(FEET) = 2.73
FLOW LENGTH(FEET) = 24.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 12.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.90

ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 7.55
PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 8.38
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 12.00 = 538.00 FEET.

FLOW PROCESS FROM NODE 12.00 TO NODE 12.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<

FLOW PROCESS FROM NODE 13.00 TO NODE 14.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 115.00
ELEVATION DATA: UPSTREAM(FEET) = 14.50 DOWNSTREAM(FEET) = 11.20

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.280
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.045
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
RESIDENTIAL
"5-7 DWELLINGS/ACRE" A 0.08 0.40 0.50 32 5.28
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA RUNOFF(CFS) = 0.42
TOTAL AREA(ACRES) = 0.08 PEAK FLOW RATE(CFS) = 0.42

FLOW PROCESS FROM NODE 14.00 TO NODE 14.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 5.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 6.045
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" A 0.03 0.40 0.50 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.03 SUBAREA RUNOFF(CFS) = 0.16
EFFECTIVE AREA(ACRES) = 0.11 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.11 PEAK FLOW RATE(CFS) = 0.58

FLOW PROCESS FROM NODE 14.00 TO NODE 12.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 4.20 DOWNSTREAM(FEET) = 2.73
FLOW LENGTH(FEET) = 19.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 1.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.42
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 0.58
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 5.33
LONGEST FLOWPATH FROM NODE 13.00 TO NODE 12.00 = 134.00 FEET.

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FLOW PROCESS FROM NODE 12.00 TO NODE 12.00 IS CODE = 11
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>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	0.58	5.33	6.020	0.40(0.20)	0.50	0.1	13.00
LONGEST FLOWPATH FROM NODE 13.00 TO NODE					12.00 =	134.00 FEET.	

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.44	7.42	4.941	0.40(0.20)	0.50	1.7	5.00
2	7.55	8.38	4.641	0.40(0.20)	0.50	1.8	9.00
3	7.36	9.39	4.341	0.40(0.20)	0.50	1.9	1.00
LONGEST FLOWPATH FROM NODE 1.00 TO NODE					12.00 =	538.00 FEET.	

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.13	5.33	6.020	0.40(0.20)	0.50	1.3	13.00
2	7.91	7.42	4.941	0.40(0.20)	0.50	1.8	5.00
3	8.00	8.38	4.641	0.40(0.20)	0.50	1.9	9.00
4	7.77	9.39	4.341	0.40(0.20)	0.50	2.0	1.00
TOTAL AREA(ACRES) =					2.02		

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

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PEAK FLOW RATE(CFS) = 8.00 Tc(MIN.) = 8.376
EFFECTIVE AREA(ACRES) = 1.94 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 2.02
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 12.00 = 538.00 FEET.

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FLOW PROCESS FROM NODE 0.00 TO NODE 0.00 IS CODE = 12
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>>>>>CLEAR MEMORY BANK # 1 <<<<<
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FLOW PROCESS FROM NODE 0.00 TO NODE 0.00 IS CODE = 12
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>>>>>CLEAR MEMORY BANK # 2 <<<<<

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FLOW PROCESS FROM NODE 0.00 TO NODE 0.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 3 <<<<<

FLOW PROCESS FROM NODE 12.00 TO NODE 15.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2.73 DOWNSTREAM(FEET) = 2.00
FLOW LENGTH(FEET) = 145.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 21.0 INCH PIPE IS 13.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.97
ESTIMATED PIPE DIAMETER(INCH) = 21.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 8.00
PIPE TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 8.86
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 15.00 = 683.00 FEET.

FLOW PROCESS FROM NODE 15.00 TO NODE 15.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<

FLOW PROCESS FROM NODE 16.00 TO NODE 17.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 170.00
ELEVATION DATA: UPSTREAM(FEET) = 16.50 DOWNSTREAM(FEET) = 14.20

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.176

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.067

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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RESIDENTIAL

"5-7 DWELLINGS/ACRE" A 0.17 0.40 0.50 32 7.18

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.74

TOTAL AREA(ACRES) = 0.17 PEAK FLOW RATE(CFS) = 0.74

FLOW PROCESS FROM NODE 17.00 TO NODE 17.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 7.18

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.067

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.10	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.10 SUBAREA RUNOFF(CFS) = 0.44
EFFECTIVE AREA(ACRES) = 0.27 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.27 PEAK FLOW RATE(CFS) = 1.18

FLOW PROCESS FROM NODE 17.00 TO NODE 18.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

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ELEVATION DATA: UPSTREAM(FEET) = 7.20 DOWNSTREAM(FEET) = 3.00
FLOW LENGTH(FEET) = 134.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.79
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.18
PIPE TRAVEL TIME(MIN.) = 0.39 Tc(MIN.) = 7.56
LONGEST FLOWPATH FROM NODE 16.00 TO NODE 18.00 = 304.00 FEET.

FLOW PROCESS FROM NODE 18.00 TO NODE 18.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<

FLOW PROCESS FROM NODE 19.00 TO NODE 20.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

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INITIAL SUBAREA FLOW-LENGTH(FEET) = 146.00
ELEVATION DATA: UPSTREAM(FEET) = 15.00 DOWNSTREAM(FEET) = 14.30

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.309
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.661

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.15	0.40	0.50	32	8.31

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA RUNOFF(CFS) = 0.60
TOTAL AREA(ACRES) = 0.15 PEAK FLOW RATE(CFS) = 0.60

FLOW PROCESS FROM NODE 20.00 TO NODE 21.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 14.30 DOWNSTREAM ELEVATION(FEET) = 11.00
STREET LENGTH(FEET) = 130.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.94
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.22
HALFSTREET FLOOD WIDTH(FEET) = 4.84
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.68
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.60
STREET FLOW TRAVEL TIME(MIN.) = 0.81 Tc(MIN.) = 9.12
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.421

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Includes row for Residential '5-7 DWELLINGS/ACRE'.

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.24 HALFSTREET FLOOD WIDTH(FEET) = 5.75
FLOW VELOCITY(FEET/SEC.) = 2.79 DEPTH*VELOCITY(FT*FT/SEC.) = 0.67
LONGEST FLOWPATH FROM NODE 19.00 TO NODE 21.00 = 276.00 FEET.

FLOW PROCESS FROM NODE 21.00 TO NODE 21.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 9.12
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.421

SUBAREA LOSS RATE DATA(AMC II):

Table with 6 columns: DEVELOPMENT TYPE/LAND USE, SCS SOIL GROUP, AREA (ACRES), Fp (INCH/HR), Ap (DECIMAL), SCS CN. Includes row for Residential '5-7 DWELLINGS/ACRE'.

SUBAREA AVERAGE PERVIOUS AREA FRACTION, $A_p = 0.50$
 SUBAREA AREA (ACRES) = 0.05 SUBAREA RUNOFF (CFS) = 0.19
 EFFECTIVE AREA (ACRES) = 0.38 AREA-AVERAGED F_m (INCH/HR) = 0.20
 AREA-AVERAGED F_p (INCH/HR) = 0.40 AREA-AVERAGED $A_p = 0.50$
 TOTAL AREA (ACRES) = 0.38 PEAK FLOW RATE (CFS) = 1.44

 FLOW PROCESS FROM NODE 21.00 TO NODE 18.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 4.00 DOWNSTREAM (FEET) = 3.00
 FLOW LENGTH (FEET) = 25.00 MANNING'S N = 0.013
 ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
 DEPTH OF FLOW IN 18.0 INCH PIPE IS 3.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 6.69
 ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
 PIPE-FLOW (CFS) = 1.44
 PIPE TRAVEL TIME (MIN.) = 0.06 T_c (MIN.) = 9.18
 LONGEST FLOWPATH FROM NODE 19.00 TO NODE 18.00 = 301.00 FEET.

 FLOW PROCESS FROM NODE 18.00 TO NODE 18.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	T_c (MIN.)	Intensity (INCH/HR)	F_p (Fm) (INCH/HR)	A_p	A_e (ACRES)	HEADWATER NODE
1	1.44	9.18	4.403	0.40 (0.20)	0.50	0.4	19.00

LONGEST FLOWPATH FROM NODE 19.00 TO NODE 18.00 = 301.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	T_c (MIN.)	Intensity (INCH/HR)	F_p (Fm) (INCH/HR)	A_p	A_e (ACRES)	HEADWATER NODE
1	1.18	7.56	4.882	0.40 (0.20)	0.50	0.3	16.00

LONGEST FLOWPATH FROM NODE 16.00 TO NODE 18.00 = 304.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	T_c (MIN.)	Intensity (INCH/HR)	F_p (Fm) (INCH/HR)	A_p	A_e (ACRES)	HEADWATER NODE
1	2.51	7.56	4.882	0.40 (0.20)	0.50	0.6	16.00
2	2.51	9.18	4.403	0.40 (0.20)	0.50	0.7	19.00

TOTAL AREA (ACRES) = 0.65

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 2.51 T_c (MIN.) = 7.562
 EFFECTIVE AREA (ACRES) = 0.58 AREA-AVERAGED F_m (INCH/HR) = 0.20
 AREA-AVERAGED F_p (INCH/HR) = 0.40 AREA-AVERAGED $A_p = 0.50$
 TOTAL AREA (ACRES) = 0.65
 LONGEST FLOWPATH FROM NODE 16.00 TO NODE 18.00 = 304.00 FEET.

 FLOW PROCESS FROM NODE 18.00 TO NODE 15.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 3.00 DOWNSTREAM(FEET) = 2.00
FLOW LENGTH(FEET) = 32.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 4.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.20
ESTIMATED PIPE DIAMETER(INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 2.51
PIPE TRAVEL TIME(MIN.) = 0.07 Tc(MIN.) = 7.64
LONGEST FLOWPATH FROM NODE 16.00 TO NODE 15.00 = 336.00 FEET.

FLOW PROCESS FROM NODE 15.00 TO NODE 15.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
=====

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.51	7.64	4.860	0.40(0.20)	0.50	0.6	16.00
2	2.51	9.25	4.381	0.40(0.20)	0.50	0.7	19.00

LONGEST FLOWPATH FROM NODE 16.00 TO NODE 15.00 = 336.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	7.13	5.85	5.754	0.40(0.20)	0.50	1.3	13.00
2	7.91	7.91	4.779	0.40(0.20)	0.50	1.8	5.00
3	8.00	8.86	4.497	0.40(0.20)	0.50	1.9	9.00
4	7.77	9.88	4.196	0.40(0.20)	0.50	2.0	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 15.00 = 683.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.42	5.85	5.754	0.40(0.20)	0.50	1.8	13.00
2	10.31	7.64	4.860	0.40(0.20)	0.50	2.3	16.00
3	10.41	7.91	4.779	0.40(0.20)	0.50	2.4	5.00
4	10.50	8.86	4.497	0.40(0.20)	0.50	2.6	9.00
5	10.41	9.25	4.381	0.40(0.20)	0.50	2.6	19.00
6	10.16	9.88	4.196	0.40(0.20)	0.50	2.7	1.00

TOTAL AREA(ACRES) = 2.67

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10.50 Tc(MIN.) = 8.862
EFFECTIVE AREA(ACRES) = 2.57 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 2.67
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 15.00 = 683.00 FEET.

FLOW PROCESS FROM NODE 15.00 TO NODE 22.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 2.00 DOWNSTREAM(FEET) = 1.85
FLOW LENGTH(FEET) = 31.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 14.6 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.25
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 10.50
PIPE TRAVEL TIME(MIN.) = 0.10 Tc(MIN.) = 8.96
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 22.00 = 714.00 FEET.

FLOW PROCESS FROM NODE 22.00 TO NODE 22.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<

FLOW PROCESS FROM NODE 23.00 TO NODE 24.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH(FEET) = 153.00
ELEVATION DATA: UPSTREAM(FEET) = 13.00 DOWNSTREAM(FEET) = 11.40

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.243

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.032

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
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RESIDENTIAL

"5-7 DWELLINGS/ACRE" A 0.14 0.40 0.50 32 7.24

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50

SUBAREA RUNOFF(CFS) = 0.61

TOTAL AREA(ACRES) = 0.14 PEAK FLOW RATE(CFS) = 0.61

FLOW PROCESS FROM NODE 24.00 TO NODE 25.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<

>>>>(STREET TABLE SECTION # 1 USED)<<<<<

UPSTREAM ELEVATION(FEET) = 11.40 DOWNSTREAM ELEVATION(FEET) = 10.40
STREET LENGTH(FEET) = 138.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.68
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.31
 HALFSTREET FLOOD WIDTH(FEET) = 9.05
 AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.79
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.55
 STREET FLOW TRAVEL TIME(MIN.) = 1.28 Tc(MIN.) = 8.53
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.596

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.54	0.40	0.50	32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50					
SUBAREA AREA(ACRES) = 0.54		SUBAREA RUNOFF(CFS) = 2.14			
EFFECTIVE AREA(ACRES) = 0.68		AREA-AVERAGED Fm(INCH/HR) = 0.20			
AREA-AVERAGED Fp(INCH/HR) = 0.40		AREA-AVERAGED Ap = 0.50			
TOTAL AREA(ACRES) = 0.68		PEAK FLOW RATE(CFS) = 2.69			

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 11.02
 FLOW VELOCITY(FEET/SEC.) = 2.02 DEPTH*VELOCITY(FT*FT/SEC.) = 0.70
 LONGEST FLOWPATH FROM NODE 23.00 TO NODE 25.00 = 291.00 FEET.

 FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<<
 =====

 FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
 =====

 FLOW PROCESS FROM NODE 26.00 TO NODE 27.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 =====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 168.00
 ELEVATION DATA: UPSTREAM(FEET) = 16.80 DOWNSTREAM(FEET) = 13.80

$T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.756

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.284

SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	0.15	0.40	0.50	32	6.76
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40						
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50						

SUBAREA RUNOFF(CFS) = 0.69
TOTAL AREA(ACRES) = 0.15 PEAK FLOW RATE(CFS) = 0.69

FLOW PROCESS FROM NODE 27.00 TO NODE 25.00 IS CODE = 62

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>(STREET TABLE SECTION # 1 USED)<<<<<
=====

UPSTREAM ELEVATION(FEET) = 13.80 DOWNSTREAM ELEVATION(FEET) = 10.40
STREET LENGTH(FEET) = 124.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 12.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curbs-to-curbs) = 0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0199

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.37
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.24
HALFSTREET FLOOD WIDTH(FEET) = 5.89
AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.93
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.72
STREET FLOW TRAVEL TIME(MIN.) = 0.70 Tc(MIN.) = 7.46
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.920

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.32	0.40	0.50	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.50
SUBAREA AREA(ACRES) = 0.32 SUBAREA RUNOFF(CFS) = 1.36
EFFECTIVE AREA(ACRES) = 0.47 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 0.47 PEAK FLOW RATE(CFS) = 2.00

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.27 HALFSTREET FLOOD WIDTH(FEET) = 7.17
FLOW VELOCITY(FEET/SEC.) = 3.16 DEPTH*VELOCITY(FT*FT/SEC.) = 0.85
LONGEST FLOWPATH FROM NODE 26.00 TO NODE 25.00 = 292.00 FEET.

FLOW PROCESS FROM NODE 25.00 TO NODE 25.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
=====

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	2.00	7.46	4.920	0.40(0.20)	0.50	0.5	26.00

LONGEST FLOWPATH FROM NODE 26.00 TO NODE 25.00 = 292.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.69	8.53	4.596	0.40(0.20)	0.50	0.7	23.00

LONGEST FLOWPATH FROM NODE 23.00 TO NODE 25.00 = 291.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.52	7.46	4.920	0.40(0.20)	0.50	1.1	26.00
2	4.55	8.53	4.596	0.40(0.20)	0.50	1.1	23.00

TOTAL AREA (ACRES) = 1.15

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 4.55 Tc (MIN.) = 8.526
EFFECTIVE AREA (ACRES) = 1.15 AREA-AVERAGED Fm (INCH/HR) = 0.20
AREA-AVERAGED Fp (INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA (ACRES) = 1.15
LONGEST FLOWPATH FROM NODE 26.00 TO NODE 25.00 = 292.00 FEET.

FLOW PROCESS FROM NODE 25.00 TO NODE 22.00 IS CODE = 31

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

=====

ELEVATION DATA: UPSTREAM (FEET) = 5.40 DOWNSTREAM (FEET) = 1.85
FLOW LENGTH (FEET) = 5.00 MANNING'S N = 0.013
ESTIMATED PIPE DIAMETER (INCH) INCREASED TO 18.000
DEPTH OF FLOW IN 18.0 INCH PIPE IS 2.8 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 25.81
ESTIMATED PIPE DIAMETER (INCH) = 18.00 NUMBER OF PIPES = 1
PIPE-FLOW (CFS) = 4.55
PIPE TRAVEL TIME (MIN.) = 0.00 Tc (MIN.) = 8.53
LONGEST FLOWPATH FROM NODE 26.00 TO NODE 22.00 = 297.00 FEET.

FLOW PROCESS FROM NODE 22.00 TO NODE 22.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.52	7.46	4.919	0.40(0.20)	0.50	1.1	26.00
2	4.55	8.53	4.595	0.40(0.20)	0.50	1.1	23.00

LONGEST FLOWPATH FROM NODE 26.00 TO NODE 22.00 = 297.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	9.42	5.95	5.702	0.40(0.20)	0.50	1.8	13.00
2	10.31	7.73	4.831	0.40(0.20)	0.50	2.3	16.00
3	10.41	8.01	4.750	0.40(0.20)	0.50	2.4	5.00

4	10.50	8.96	4.468	0.40(0.20)	0.50	2.6	9.00
5	10.41	9.35	4.352	0.40(0.20)	0.50	2.6	19.00
6	10.16	9.98	4.167	0.40(0.20)	0.50	2.7	1.00

LONGEST FLOWPATH FROM NODE 1.00 TO NODE 22.00 = 714.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.63	5.95	5.702	0.40(0.20)	0.50	2.6	13.00
2	14.70	7.46	4.919	0.40(0.20)	0.50	3.3	26.00
3	14.84	7.73	4.831	0.40(0.20)	0.50	3.4	16.00
4	14.95	8.01	4.750	0.40(0.20)	0.50	3.5	5.00
5	15.01	8.53	4.595	0.40(0.20)	0.50	3.6	23.00
6	14.92	8.96	4.468	0.40(0.20)	0.50	3.7	9.00
7	14.71	9.35	4.352	0.40(0.20)	0.50	3.8	19.00
8	14.27	9.98	4.167	0.40(0.20)	0.50	3.8	1.00

TOTAL AREA(ACRES) = 3.82

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 15.01 Tc(MIN.) = 8.529
EFFECTIVE AREA(ACRES) = 3.64 AREA-AVERAGED Fm(INCH/HR) = 0.20
AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
TOTAL AREA(ACRES) = 3.82
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 22.00 = 714.00 FEET.

FLOW PROCESS FROM NODE 22.00 TO NODE 28.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1.85 DOWNSTREAM(FEET) = 0.95
FLOW LENGTH(FEET) = 45.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 11.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.82
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.01
PIPE TRAVEL TIME(MIN.) = 0.08 Tc(MIN.) = 8.61
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 27.00 = 759.00 FEET.

FLOW PROCESS FROM NODE 28.00 TO NODE 29.00 IS CODE = 41

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 0.95 DOWNSTREAM(FEET) = 0.00
FLOW LENGTH(FEET) = 32.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 24.0 INCH PIPE IS 10.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 11.37
GIVEN PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 15.01
PIPE TRAVEL TIME(MIN.) = 0.05 Tc(MIN.) = 8.65
LONGEST FLOWPATH FROM NODE 1.00 TO NODE 28.00 = 791.00 FEET.

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 3.82 TC(MIN.) = 8.65

EFFECTIVE AREA(ACRES) = 3.64 AREA-AVERAGED Fm(INCH/HR)= 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.40 AREA-AVERAGED Ap = 0.50
 PEAK FLOW RATE(CFS) = 15.01

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	13.63	6.07	5.636	0.40(0.20)	0.50	2.6	13.00
2	14.70	7.59	4.874	0.40(0.20)	0.50	3.3	26.00
3	14.84	7.86	4.794	0.40(0.20)	0.50	3.4	16.00
4	14.95	8.13	4.714	0.40(0.20)	0.50	3.5	5.00
5	15.01	8.65	4.559	0.40(0.20)	0.50	3.6	23.00
6	14.92	9.08	4.431	0.40(0.20)	0.50	3.7	9.00
7	14.71	9.48	4.315	0.40(0.20)	0.50	3.8	19.00
8	14.27	10.10	4.140	0.40(0.20)	0.50	3.8	1.00

=====
 END OF RATIONAL METHOD ANALYSIS

TTM 15323
Newport Beach, CA

Section 5
Hydrology Maps