

Norfolk Naval Shipyard Restoration Advisory Board (RAB) Meeting Summary: November 15, 2001

RAB Members Present

J. Brewer Moore	Community Co-chair
Mike Host	NNSY Co-chair
Tim Reisch	LANTDIV
Devlin Harris	Virginia DEQ
Mark Stephens	USEPA
Louis Whitehead	Community Rep
Dan Roper	UCACE
Ross Worsham	Community Rep
Carl Fisher	Community Rep
James Gildea	City of Portsmouth
Janette Whitley	Community Rep
Margaret Lordi	Community Rep
Morris Roberts Jr.	VIMS

RAB Participants

Lyle Jackson	Cradock Community/ERP
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RAB Participants continued

Donna Caldwell	CH2M HILL
Elaine Colston	NNSY
Ann Reed	Elizabeth River Project
Russ Chantry	NNSY
Jan Nielsen	NNSY
Heidi Maupin	LANTDIV

RAB Members Absent:

George Harlow Jr.	US Geological Survey
Edmund Giles	Community Rep
Melody Repanshek	Community Rep
Raleigh Harsley	Community Rep
William Copeland	Community Rep
Peter Knight	NOAA/Coastal Resources
Susan Lingenfelter	U.S. Fish and Wildlife

FROM: Donna Caldwell/CH2M HILL/HRO

DATE: July 25, 2001

LOCATION

Holiday Inn Olde Towne Portsmouth, Virginia

Meeting Summary

Opening Remarks

Mr. Moore lead the introduction of members and participants. Mike Host introduced Daniel Roper, new member representative for the US Army Corps of Engineers (USACE). Mr. Host noted that Mr. Lyle Jackson has requested membership to the RAB. Mr. Moore acknowledged that the RAB will vote on his membership at the next meeting.

Paradise Creek Park

Mr. Moore summarized the success along Paradise Creek at New Gosport. Mr. Moore then summarized the proposed resolution that was presented by State Senator Fred Quayle before the State legislature on the 2000 docket. The resolution was held over to 2001. The Quayle Resolution is to fund a Feasibility Study to address future land use along Paradise Creek. Mr. Moore expressed his optimism that the resolution would pass. Senator Quayle is prepared to make this his first introduction to the legislature in January 2002. The RAB voted to express to Senator Quayle its full support for the resolution. Mike noted this resolution is a first step towards evaluating the feasibility of future land uses and noted it is likely to be a complicated process but one worthy of investigating. Dr. Fisher noted that "lobby day" in Richmond may be a way for members to show support for the resolution.

Dr. Fisher updated the RAB on the Elizabeth River Project (ERP) initiatives. The ERP's Watershed Action Plan (5- years old) has recently been updated, and addresses restoration along the river. Paradise Creek was identified as an area for restoration through partnerships. ERP funded Dr. Dauer to investigate Paradise Creek using the Benthic Index of Biotic Integrity (BIBI) approach (discussed at an earlier RAB meeting). Partnership efforts include: reaching into the community to solicit support and ideas for restoration of Paradise Creek, the initiation of a program known as "River Stars" to enlist industry or organizations to aid in habitat restoration and pollution prevention, and an outreach program to distribute information to stakeholders and residents about how they can participate. A grant has been received to implement these elements.

Nominating Committee

Nominating committee (Dr. Fisher and Mr. Gildea) contacted all parties, and identified Janette Whitley as nominee for the position of RAB Co-chair. Mr. Moore asked for other nominations. None were offered. There were no objections or nominations and the nominations closed. Ms. Whitley was elected the RAB co-chair. Mr. Chantry presented an appreciation certificate to Mr. Moore for his service as RAB co-chair.

Cross Boundary Contamination AWII and NNSY Site 9

Tim Reisch presented a summary of the work ongoing to address contamination across NNSY and Atlantic Wood Industries Inc. (AWII) boundary. Mr. Reisch summarized the known contamination. He noted the joint approach by the Navy and AWII. The approach includes possible wetlands creation in the area where calcium hydroxide sludge would be removed, and the development of a green space area. Partnership between Navy, AWII, the RAB, and NNSY has been successful from a technical standpoint. Mark Stephens praised Mr. Reisch for his efforts in this action. Mr. Reisch summarized the proposed remedial actions combining removal of calcium hydroxide and soil cover of polycyclic aromatic hydrocarbons (PAH) contamination. Dr. Fisher asked about storm drains in the proposed plans. Mr. Reisch noted that storm drains are already in place. A settlement agreement is being drafted between Navy, Department Of Justice (DoJ), and AWII to address this area of contamination. In the coming weeks the Navy will delineate the extent of calcium hydroxide through trenching activities. Mr. Gildea asked about the size of the area of delineation. Mr. Reisch estimated 1-2 acres. Dr. Fisher thought the proposal was a good plan and asked how the RAB could demonstrate their support. Mike Host noted that if RAB members had additional comments after the meeting, they could be forwarded to NNSY via the co-chair. Mr. Moore asked about the acreage of AWII. Ross Worsham replied AWII was about 47 acres. AWII ceased wood treating operations in 1992 and now is involved in concrete operations. Mr. Gildea asked if the contamination is in the water column or is it a benthic

organism concern. Ross Worsham noted the benefit of removal to eliminate infiltration through the waste. Mr. Jackson asked if removed where would the waste go. Mike Host responded that it is not known at this time, but it would most likely be landfilled. Mark Stephens commented that this is a complicated legal issue and the parties are working hard to resolve the issues. Ms. Lordi commented that it was worth noting that part of AWII was leased to the Navy during the war in the 1940s. Mr. Stephens clarified that this area is not the same as those areas that had been leased and that there is no dispute in the leased area. Dr. Fisher commented that he appreciated the forthcoming nature of the parties to inform the RAB of this joint effort.

Remedial Investigation (RI) / Human Health Risk Assessment (HHRA)– Scott Center and Paradise Creek Landfills

Tim Reisch presented a summary of the RI/HHRA for the Paradise Creek Landfills. He noted completion of the Scott Center Landfill RI/HHRA in October 2001. A handout of the presentation was provided. Mr. Reisch summarized the documents that have been completed (Scott Center RI/HHRA) and the documents in progress (Ecological Risk Assessment for Paradise Creek, and RI/HHRA for Paradise Creek Disposal Area. He summarized the findings of the Scott Center RI.

Heidi Maupin (LANTDIV) summarized the findings of the HHRA, discussing the assessment of both cancer and non-cancer risks to various human receptors under various future property use scenarios. Mr. Gildea asked what is meant by "non-cancer" risk. Ms. Maupin explained that it reflected an adverse health reaction that is not associated with cancer. Ross Worsham asked about the potential for risk in the Yorktown Aquifer. In response, Mark Stephens explained the ultra conservative nature of the risk assessment using maximum concentrations, suggesting that the potential risk is low.

Tim Reisch summarized the next steps for the sites in the Feasibility Study. Dr. Fisher asked how the assessment would address fish consumption. Tim Reisch explained the currently planned approach to addressing fish consumption, noting that it presented a complex technical issue. Dr. Roberts noted the need to also consider blue crabs, and that VIMS has some fish tissue study data that may be helpful. Dr. Fisher noted there may be some people who consume whole fish, rather than just fish fillets.

Community Relations Plan

Jan Nielsen presented a summary of the approach NNSY has developed for updating its IR Community Relations Plan (CRP). A handout of the presentation was provided. NNSY is soliciting input from the RAB on the selection of potential persons to interview for the plan. Ms. Nielsen also provided a list (with definitions) of commonly used IR Program acronyms.

Next Meeting Schedule

NNSY will coordinate with the Community Co-Chair to select the date for the next meeting, which is expected to take place in the February 2002 time frame.

Meeting Adjourned at 7:00 PM.

NORFOLK NAVAL SHIPYARD
RESTORATION ADVISORY BOARD MEETING

Revised Agenda

Holiday Inn Olde Towne Portsmouth
8 Crawford Parkway
Portsmouth, Virginia 23704
Thursday November 15, 2001

START TIME	TOPIC	OBJECTIVE	SPEAKER
5:00 p.m.	Opening Remarks	Review Meeting Objectives	(Co-chair) J. Brewer Moore NNSY (P. M. Host)
	Paradise Creek Park	Presentation of Status of Resolution	(Co-chair) J. Brewer Moore
	Paradise Creek Restoration Plan		(RAB Community Member) Dr. Fisher
	Nominating Committee	Nomination for Community Co-Chair	(RAB Community Member) Dr. Fisher
	Voting for Community Co-Chair		(Co-chair) J. Brewer Moore
	Recognition of Exiting Co-Chair		NNSY
	Site 9 - Southgate	Status of work at Site 9	LANTDIV (T Reisch)
	Remedial Investigation Scott Center - OU1		LANTDIV (T Reisch)
	Human Health Risk Assessment Paradise Creek Landfill - OU 2		LANTDIV (H. Maupin)
	Community Relations Plan	Status	NNSY (J. Nielsen)
	Group Discussion and Questions		
	Next Meeting	January/February Timeframe	NNSY (J. Nielsen)
7:00 p.m.	Adjourn		

Requesting the Department of Conservation and Recreation to study future land use along Paradise Creek and to recommend ways the Commonwealth might participate in the development of a public park, a recreational area and a wildlife preserve.

Patron – Quayle

WHEREAS, the Environmental Protection Agency (EPA) has placed lands and tidal wetlands along Paradise Creek within the Norfolk Naval Shipyard, located in the City of Portsmouth between the George Washington Highway (U.S. Route 17) and the southern branch of the Elizabeth River, on the National Priorities List; setting in motion Superfund remediation efforts by the U.S. Navy, and research by its Restoration Advisory Board to suggest what land uses might be acceptable once EPA standards have been met; and

WHEREAS, the Norfolk Naval Shipyard Restoration Advisory Board and the City of Portsmouth are in agreement that an open space corridor consisting of park, wildlife habitat and recreational lands is an acceptable future use for this stretch along Paradise Creek; and

WHEREAS, Paradise Creek is situated in the Colonial-era core of the Norfolk Metropolitan Area where urban density is high and public open space is limited; and

WHEREAS, the preservation of open space will result in the addition of public park land, the enhancement of wildlife habitat, and restoration of the Elizabeth River, into which Paradise Creek flows; and

WHEREAS, the Norfolk Naval Shipyard and the World War I community of Cradock, which borders Paradise Creek, are listed on our State and National Registers of Historic Places; and

WHEREAS, as Virginia's fourth most fiscally stressed municipality, it would be difficult for Portsmouth to fund development of a waterfront park; and recognizing that the metropolitan area has no regional park authority; now, therefore, be it

RESOLVED by the Senate, the House of Delegates concurring, That the Department of Conservation and Recreation be requested to study future land use along Paradise Creek and to recommend ways the Commonwealth might participate in the development of a public park, recreational area and wildlife preserve. In conducting its study, the Department of Conservation and Recreation shall communicate with appropriate federal agencies, the U.S. Navy, the Elizabeth River Project, the Hampton Roads Planning District Commission, and the City of Portsmouth.

All agencies of the Commonwealth shall provide assistance to the Department of Conservation and Recreation for this study, upon request.

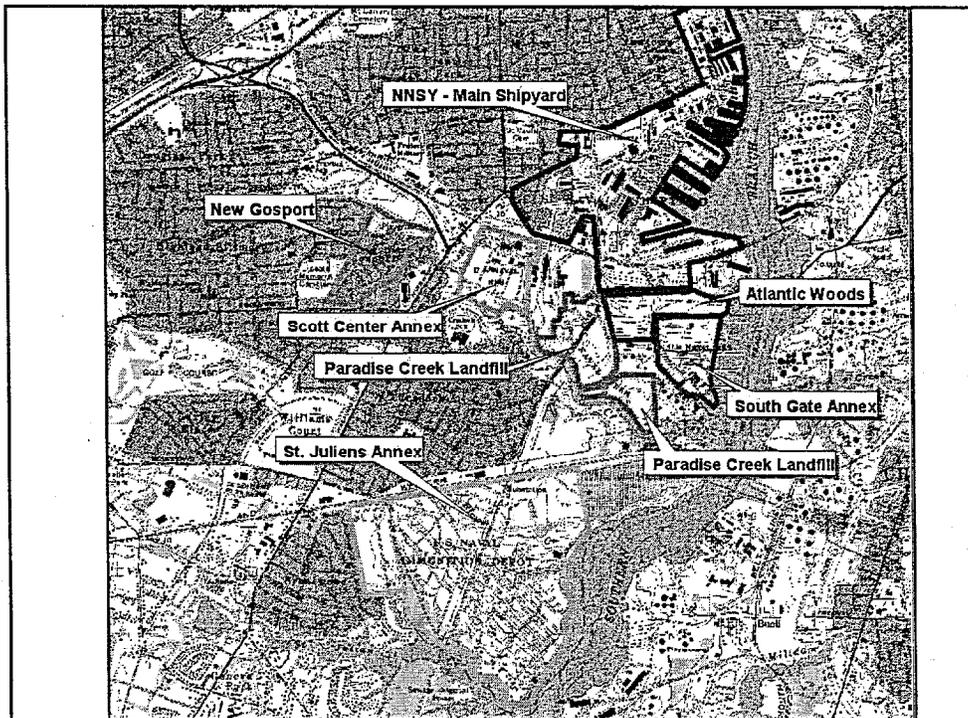
The Department of Conservation and Recreation shall complete its work in time to submit its findings and recommendations to the Governor and the 2003 Session of the General Assembly.

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Presentation Outline

- Site background
- Summary of cross-boundary contamination issues
- Combined remediation and redevelopment concept for AWII
- Proposed response action approach
- Path-forward to implement the approach



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Cross-Boundary Conditions

- Overview of ABM, CaOH sludge, and PAH contamination distribution
 - Based solely on data collected by the Navy
 - Navy data provides sufficient delineation to implement Joint Approach
 - EPA data required to assist in the determination of future claims settlement
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Goals for AWII Remediation/ Redevelopment Approach

- Coordinate development with remediation
 - Expedite response action
 - Expedite site development
 - Restore site to productive use
 - Support community revitalization efforts
 - Promote economic development at the site and nearby properties
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Natural Resource Value Enhancements

- Development of a high quality wetland in the CaOH sludge area
- Include “green-space” and natural sight barriers in the plan
- Use natural treatment systems for stormwater



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Joint Approach

- EPA initiated dialogue between Navy and AWII via RAB and NNSY partnering
 - Further discussions between EPA, VDEQ, AWII, and the Navy lead to meeting on May 24th
 - Joint approach for cross-boundary response developed at this meeting
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Joint Approach

- Proposed response actions can address co-located contaminants (e.g., ABM and PAH)
 - Constructing separate remedies to the property line doesn't make sense and won't save costs
 - Navy prepared to lead CaOH removal
 - AWII prepared to lead capping of soils where there is co-located contamination
- ⋮

Draft Remedial Investigation (RI)
 Site 2 (OU#1) Scott Center Landfill
 Sites 3-7 (OU#2) Paradise Creek Disposal Area
 (September 1998)

- Define Nature & Extent of Contamination
- Assess risks to Human Health
 - Human Health Risk Assessment (HHRA)
- Assess risks to the Environment
 - Ecological Risk Assessment (ERA)

Draft ERA - Paradise Creek
 Site 1, 2 (OU#1), and 3-7 (OU#2)

- Assess risks to the Environment
 - Conceptual Site Model (establish exposure)
 - Surface Water and Sediment Sampling
 - Conservative Screening against EPA Criteria
 - Risk Characterization (food chain modeling)
 - Uncertainties
 - Risk Management

Draft-Final RI
 Sites 3-7 (OU#2) Paradise Creek Disposal Area
 (July 2000)

- Defines Nature & Extent of Contamination
- Human Health Risk Assessment (HHRA)
 - Soils and Groundwater (Disposal Area)
 - Surface Water and Sediments (Paradise Creek)
 - Fish Consumption (Paradise Creek)

Final RI
 Site 2 (OU#1) Scott Center
 (October 2001)

- Defines Nature & Extent of Contamination
- Human Health Risk Assessment (HHRA)
 - Soils and Groundwater (Disposal Area)

Draft Feasibility Study
 Sites 3-7 (OU#2) Paradise Creek Disposal Area

- Development of Remedial Action Objectives (RAOs)
 - Relate contamination & exposure to NCP remedy objectives
- Development of Preliminary Remediation Goals (PRGs)
 - Address Risks to Human Health
 - Address Risks to the Environment
- Develop Remedial Action Alternatives
- Evaluation of Remedial Action Alternatives

Draft Feasibility Study
 Site 2 (OU#1) Scott Center

- Development of Remedial Action Objectives (RAOs)
 - Relate contamination & exposure to NCP remedy objectives
- Development of Preliminary Remediation Goals (PRGs)
 - Address Risks to Human Health
 - Address Risks to the Environment
- Develop Remedial Action Alternatives
- Evaluation of Remedial Action Alternatives

Proposed Plan
 Sites 3-7 (OU#2) Paradise Creek Disposal Area

- Present Proposed Remedial Action Alternative to Public for Comment

Proposed Plan
 Site 2 (OU#1) Scott Center

- Present Proposed Remedial Action Alternative to Public for Comment

Record of Decision (ROD)
 Sites 3-7 (OU#2) Paradise Creek Disposal Area

- Respond to Public Comments on the Proposed Plan.
- Defines, legally, actions to be taken for Site Remediation.

Record of Decision (ROD)
 Site 2 (OU#1) Scott Center

- Respond to Public Comments on the Proposed Plan.
- Defines, legally, actions to be taken for Site Remediation.

005965012

NNSY Update to the Community Relations Plan

Presented to the NNSY
Restoration Advisory Board
November 15, 2001

Community Relations Plan

- Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)
- Environmental Protection Agency Guidance Provided

Norfolk Naval Shipyard's Community Relations Plan

- Original Issued July 1994
- Revision will:
 - Review Methods Used to Keep the Community Informed of Activities
 - Update the Status of the Shipyard on the National Priorities List
 - Update the Status of the Sites
- Interviews of Community Members

Interviews

- 15 - 25 Interviews
- Shipyard Personnel will Participate in All Interviews
- Confidential Results of the Interviews will be Used to Revise the Community Relations Plan

Community Interviews

- State Agency Staff (Officials from Health, Environmental or Natural Resources Departments)
- Local Agency Staff and Elected Officials (Health Department Officials, Commissioners, Mayor, Officials Serving on Environmental Commissions, Local Advisory Committees and Planning Boards)
- Representatives of Citizens Groups and Local Civic Groups or Neighborhood Associations

Community Interviews (Continued)

- Area Residents and Individuals Not Affiliated with any Group, Both Those Living Near and Those Living a Little More Distant From the Sites
- Local Business Representatives
- Local Chapters of Public Interest Groups (Sierra Club, Wilderness Society, League of Women Voters)
- Local School Principals

Community Interviews (Continued)

- Other Potentially Responsible Parties
- Media Representatives
- NNSY Employees

Contact List for Interviews

- Preliminary List
- List Includes Individuals and Groups:
 - Contact with the Shipyard
 - Worked with the Shipyard
 - Contacted Members of the RAB
 - Attended RAB Meetings
- Input from RAB

Jan Nielsen
Installation Program Manager
396-7231 extension 168

e-mail: nielsenjl@nnsy.navy.mil

Norfolk Naval Shipyard
OSHE Office, Code 106.3
Building M-22, 3rd Floor
Portsmouth, VA 23709-5000
Attn: Jan Nielsen, Code 106.31

Community Relations Plan for NNSY
Potential Interviews

Interview Category	Name	Organization
State Agency Staff (Officials from health, environmental or natural resources departments)		
	Mr. S. William Berg	Director of Public Health, Portsmouth (Acting)
		Virginia Institute of Marine Science
Local agency staff and elected officials (county health department officials, county commissioners, mayor, officials serving on environmental commissions, local advisory committees and planning		
	Honorable J. Thomas Benn, III	City of Portsmouth Official (City Counsel)
	Honorable/Dr. James W. Holley, III	Mayor of Portsmouth
	Mr. Charlie Mills	City of Portsmouth Planner
	Mr. Daniel M. Stuck	City Manager
Representatives of citizens groups and local civic groups or neighborhood associations		
	Mr. James Adams	Fairview Heights Civic League
	Mr. Reginold Allen	Brighten Prentis Park
	Mr. James Klender	Highland Biltmore Civic League
	Mr. Jeff Barba	Cradock Area Civic Coalition
	Ms. Jane E. Jones	Cradock Civic League
	Mr. Eugene Spires	Effingham Plaza Civic League
	Ms. Mattie Hubbard	Lincoln Park Tenant Council
		Piedmont Heights
Area residents and individuals not affiliated with any group, both those living near and those living a		
	Mr. Kenny Mann	Resident of Belcourt Near Gosport Homes
	Ms. Anne Reed	Resident of Admirals Landing
	Mr. Christopher R. Branch	Resident of Belcourt Near Gosport Homes
	Ms. Rene Ballard	Resident of Highland Biltmore
Local business representatives		
	Mr. Ron Weiss and Ms. Berle Weiss	Owner of Bed and Breakfast
	Mr. Steve Bergfield	TCC Instructor
		Tidewater Feed and Seed
		Hearthside Realty
Local chapters of public interest groups (Sierra Club, Wilderness Society, League of Women		
	Ms. Marjorie Mayfield	Elizabeth River Project
	Ms. Ann Douglas Smith	Mayor's Military Affairs Committee

Community Relations Plan for NNSY
Potential Interviews

Interview Category	Name	Organization
Local School Principals		
	Mr. J. Harrison Coleman	Emily Sprong Elementary
	Dr. Bailey	Cradock Middle School
	Dr. C.R. Bailey	Hunt Mapp Middle School
	Ms. Doris McNeal	Brighton Elementary School
Media Representatives		
	Mr. Scott Harper	Virginian Pilot
Potentially Responsible Parties		
		Atlantic Woods
		Peck Iron Works
NNSY Employees		
	Mr. Jimmy Blick	IFPTE Representative
	Mr. B. A. Napoleon	MTC Conf Committee

ENVIRONMENTAL ACRONYM LIST

3DWQM	Chesapeake Bay Three Dimensional Time Variable Water Quality Model
A	Flame Atomic Absorption. See Method Qualifier
A	Indicates that a TIC is a suspected aldol-condensation product. See Data Qualifiers
A-106	Office of Management and Budget Circular #A-106
A ² R ²	Annual Allowance and Requirements Review (Oil Spill Equipment)
AA	Atomic Absorption
AA	Associate Administrator
AA	Assistant Administration
AAQS	Ambient Air Quality Standard
ABS	Percent of constituent Absorbed, unitless
ACE	Army Assistant Chief of Engineers
ACGIH	American Conference of Governmental Industrial Hygienists
ACH	Air Changes per Hour
ACHP	Advisory Council on Historic Preservation
ADD	Applied Daily Dose
ADD _{food}	Applied Daily Dose from food item
AE	Assimilation Efficiency
A-E	Architect-Engineer
AEC	Area Environmental Coordinator
AEERL	Air and Energy Engineering Research Laboratory
AEGLs	acute exposure guideline levels
AET	Apparent Effect Threshold
AF	Soil Adherence Factor to skin, mg/cm ²
AFCEE	Air Force Center for Environmental Excellence
AFS	AIRS Facility Subsystem (subsystem of AIRS)
Ag	Silver
AHERA	Asbestos Hazard Emergency Response Act
AIDE	Annie Interactive Development Environment
AIR RISC	Air Risk Information Support Center
AIRS	Aerometric Information Retrieval System
AIRFA	American Indian Religious Freedom Act
Al	Aluminum

AL	Action Level
ALA	American Library Association
ALARA	Acronym for "as low as reasonably achievable."
AM	Action Memorandum
AMAES	Activity and Management Automated Environmental System
AMEM	A.D.L. Migration Estimation Model
AML	ARC Macro Language
AMRL	Applied Marine Research Laboratory
AMS	AIRS Area/Mobile Source Subsystem (subsystem of AIRS)
ANPR	Advanced Notice of Proposed Rulemaking
ANS	Aquatic Nuisance Species
ANSI	American National Standards Institute
AO	Office of the Administrator
AOC	Area of Concern
AOPC	Area of Potential Concern
AOU	Accelerated Operable Unit
APTIC	Air Pollution Technical Information Center
APCD	Air Pollution Control District
APEG	Alkaline Polyethylene Glycol
APH	Adsorbed-Phase Hydrocarbon
API	American Petroleum Institute is an organization of the petroleum industry.
APOW	Annual Plan of Work
APR	Air Purifying Respirator
AQCDs	Air Quality Criteria Documents
AQD	Air Quality District
AQS	Air Quality Subsystem (subsystem of AIRS)
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirement
AREAL	Atmospheric Research and Exposure Assessment Laboratory
ARF	Administrative Record File
ARPA	Archaeological Resources Protection Act
ARTT	Alternative Remediation Technology Team
As	Arsenic
AS	Semiautomated Spectrophotometric. See Method Qualifier
ASCII	American Standard Code for Information Interchange (Computer Language)
ASMD	Atmospheric Sciences Modeling Division

ASN(I&E)	Assistant Secretary of the Navy (Installation and Environment)
AST	Aboveground Storage Tank
ASTER	Assessment Tools for the Evaluation of Risk
ASTM	American Society for Testing and Materials
AT	Averaging Time, day
ATEG	Potassium (or Sodium) Hydroxide Tetraethylene Glycol
ATSDR	Agency for Toxic Substances and Disease Registry
ATTIC	Alternative Treatment Technology Information Center
Au	Gold
AUF	Area Use Factor
AUL	Authorized Use List (HAZMAT)
AV	Automated Cold Vapor AA. See Method Qualifier
AWBERC	Andrew W. Breidenbach Environmental Research Center
AWQC	Ambient Water Quality Criteria
AWQS	Ambient Water Quality Standards
b	Saturated thickness of an aquifer
B	Detected in Blank. See Data Qualifiers
Ba	Barium
BACT	Best Available Control Technology
BADT	Best Available Demonstrated Technology
BAF	Bioaccumulation Factor
BAL	British Anti-Lewisite. A name for the drug dimecaprol—a treatment for toxic inhalations.
BBS	Bulletin Board System
BC	Blind Copy
BCD	Base-Catalyzed Decomposition (Process)
BCF	Bioconcentration Factor
BCM	Blood-clotting mechanism effects.
BCP	BRAC Cleanup Plan
BCT	BRAC Cleanup Team
BD/DR	Building Demolition/Debris Removal
BDAT	Best Demonstrated Available Technology
BDL	Below Detection Limits
Be	Beryllium
BEC	BRAC Environmental Coordinator
BEP	bis(2-ethylhexyl)phthalate

BERA	Baseline Ecological Risk Assessment
BG	Background
bgs	below ground surface
BHC	Benzene Hexachloride (Lindane)
Bi	Bismuth
BIOS	Biological Data System (file within STORET)
BLIS	RACT/BACT/LAER Information System
BLM	Bureau of Land Management
BMD	Benchmark Dose
BMP	Best Management Practice
BNA	Base-Neutral and Acid-Extractable organic compounds - now SVOCs
BOD	Biochemical/Biological Oxygen Demand
BOM, or BuMINES	Bureau of Mines, U.S. Department of Interior.
BP	Boiling Point
Br	Bromine
BRA	Baseline Risk Assessment
BRAC	Base Realignment And Closure
BRS	Bibliographic Retrieval System
BRS	Biennial Reporting System
BSL	BTAG Screening Level
BTAG	Biological Technical Assistance Group
BTC	Base Transition Coordinator
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
BTU	British Thermal Unit
BTX	Benzene, Toluene and Xylene
BUMED	Bureau of Medicine and Surgery
BW	Body Weight, kg
°C	Degrees Celsius - Centigrade, a unit of temperature.
C	Carbon
C	Manual Spectrophotometric. See Method Qualifier
Ĉ	Data qualifier for pesticide data, indicates results where identification was confirmed by GC/MS.
C	Closure
Ca	Calcium
CA	Chemical concentration in Air
CA	Cooperative Agreement

CA	Corrective Action or Cleanup Action
CA	Cost Analysis
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAS	Contractor Advisory and Assistance Services
CADD	Computer Aided Design and Drafting
CADRE	Computer Aided Data Retrieval and Evaluation Software
CAG	Cancer Assessment Group
CAH	Chlorinated Aliphatic Hydrocarbon
Cal/EPA	California Environmental Protection Agency
CAMU	Corrective Action Management Unit
CAP/CAPI	Corrective Action Plan/ Corrective Action Plan Implementation
CAP88-PC	Clean Air Act Assessment Package-1988
CARA	Chemical Assessments and Related Activities
CARB	California Air Resources Board
CARD	Contract Laboratory Program Analytical Results Database
CARL	Colorado Association of Research Libraries
CARS	Corrective Action Reporting System (now known as RCRIS)
CAS	Chemical Abstract Service (Registry Number)
CATEX	Categorical Exclusion
CAU	Carbon Adsorption Unit
CAX	Cheatham Annex
CBI	Confidential Business Information
CBC	Construction Battalion Center
CC	Closed cup
CC	Carbon Copy
cc, cm ³	Cubic centimeter.
CCC	Calibration Check Compounds
Cd	Cadmium
CDC	Centers for Disease Control
CDF	Confined Disposal Facility
CDI	Chronic Daily Intake
CDS	Compliance Data System (now part of AIRS)
CDS/ISIS	CDS/Integrated Set of Information System
CE	Categorical Exclusion
CEAM	Center for Exposure Assessment Modeling

CEC	Civil Engineer Corps
CECOS	Civil Engineer Corps Officer School
CEIC	Caribbean Environmental Information Center
CEM	Continuous Emission Monitoring
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CERFA	Community Environmental Response Facilitation Act
CERI	Center for Environmental Research Information
CERIS	Center for Environmental and Regulatory Systems
CERL	Corvallis Environmental Research Laboratory
CEU	Continuing Education Units
CF	Conversion Factor
CFB	Circulating Fluidized Bed
CFC	Chlorofluorocarbon
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
cgs	Metric units of measure based upon centimeter, gram, and second.
CH ₄	Methane
CHEM	Chemical Collection Database (accessible through OLS)
CSEPP	Chemical Stockpile Emergency Preparedness Program
CHEMTREC	Chemical Emergency Transportation Center
CHF	Contaminant Hazard Factor
CHIC	CFC/Halon Information Clearinghouse
CHIL	Consolidated Hazardous Items List
CHINFO	Navy Chief of Information
CHPPM	Army Center for Health Promotion and Preventive Medicine
CHRIMP	Consolidated Hazardous Material Reutilization and Inventory Management
CHRIS	Chemical Hazards Response Information System
CHT	Collection, Holding and Transfer (System)
CI	Confidence Interval
CIAC	Centro de Informacion Ambiental del Caribe
CIC	Consumer Information Catalog
CICIS	Chemicals in Commerce Information System
CIH	Certified Industrial Hygienist

CINCLANTFLT	Commander in Chief, Atlantic Fleet
CINCPACFLT	Commander in Chief, Pacific Fleet
CIS	Chemical Information Systems, Inc.
Cl	Chlorine
CLC	Clean Lakes Clearinghouse
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CLIM	Climate Change Database (accessible through OLS)
CLP	Contract Laboratory Program
CLU-IN	Clean-Up Information Bulletin Board System formerly OSWER-BBS)
CMC	Commandant of the Marine Corps
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CNB	Commander, Naval Base
CNG	Compressed Natural Gas
CNO	Chief of Naval Operations
CNS	Central Nervous System, the brain and spinal cord.
Co	Cobalt
CO	Commanding Officer or Contracting Officer
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COC	Contaminant/Chemical of Concern
COC	Chain of Custody
COD	Chemical Oxygen Demand
COE	Corps of Engineers (Army)
COEC	Contaminant of Ecological Concern
COFR	Certificate of Financial Responsibility
COMNAVBASE	Commander, Naval Base
COMNAVFACECOM	Commander, Naval Facilities Engineering Command
COMPTRAK	Marine Corps Environmental Compliance Tracking System
CONUS	Continental United States
COPC	Contaminant/Chemical of Potential Concern
CORMIX	Cornell Mixing Zone Model
COTR	Contracting Officer's Technical Representative
CP/PCP	Closure Plan/Post Closure Plan
CPAF	Cost Plus Award Fee (Contract)
CPF	Carcinogenic Potency Factor

CPFF	Cost Plus Fixed Fee
CPR	Cardiopulmonary Resuscitation
CPT	Cone Penetrometer Test
CQC	Construction Quality Control
Cr	Chromium
CR	Consumption Rate, L/day
CRADAs	Cooperative Research and Development Agreements
CRAVE	Carcinogenic Risk Assessment Verification Endeavor
CRC	Community Relations Coordinator
CRDL	Contract Required Detection Limit
CRL	Central Regional Laboratory
CRP	Community Relations Plan
CRQL	Contract Required Quantitation Limit
CRZ	Contaminant Reduction Zone
CS	Chemical concentration in Soil, mg/kg
CS	Confirmation Study
CSF	Carcinogenic Slope Factor
CSM	Conceptual Site Model
CSMoS	Center for Subsurface Modeling Support
CTC	Control Technology Center
CTC	Cost To Complete
CTG	Control Technology Group
CTO	Contract Task Order
Cu	Copper
cu ft, ft ³	Cubic foot
cu m, m ³	Cubic meter
CV	Coefficient of Variation
CV	Manual Cold Vapor AA
CVOC	Chlorinated Volatile Organic Compound
CW	Circulating Well
CW	Chemical concentration in Water
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
D	Indicates sample was diluted.
D & N	Discovery and Notification
DA event	Absorbed Dose per Event

DAD	Dermally Absorbed Dose
DAF	Dilution/Attenuation Factor
DASN (ES)	Deputy Assistant Secretary of the Navy (Environment and Safety)
DBOF	Defense Business
dB	Decibel
DCA	Dichloroethane
DCAA	Defense Contract Audit Agency
DCE	Dichloroethene or Dichloroethylene
DCNO	Deputy Chief of Naval Operations
DCP	Dichlorophenol
DD	Decision Document
D/DBP	Disinfection and Disinfection Byproducts
DDD	Dichlorodiphenyldichloroethane (Rhothane)
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
DEC	Department of Environmental Conservation
DEHNR	Department of Environment, Health and Natural Resources
DEIS	Draft Environmental Impact Statement
DEMIS	Defense Environmental Management Information System
DENIX	Defense Environmental Network and Information Exchange
DEP	Department of Environmental Protection
DEQ	Virginia Department of Environmental Quality
DER	Department of Environmental Resources
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DERPMIS	Defense Env'l Restoration Program Management Information System, now RMIS
DERTF	Defense Environmental Restoration Task Force
DF	Diet Fraction
DFS	Daily Flow System (file within STORET)
DFM	Diesel Fuel Marine
dH/dX	Hydraulic Gradient
DLA	Defense Logistics Agency
DMR	Discharge Monitoring Report
DMSO	Dimethyl Sulfoxide
DNAPL	Dense Non-Aqueous Phase Liquid
DNR	Department of Natural Resources

DNRC	Department of Natural Resources and Conservation
DO	Dissolved Oxygen
DOA U.S.	Department of Army
DOAF U.S.	Department of Air Force
doc	Dissolved Organic Carbon
DOC	Department of Commerce
DOC	Department of Conservation
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
DOIT	Demonstration of On-site Innovative Technologies
DOJ	Department of Justice
DOL	Department of Labor
DON	Department of the Navy
DOS	Department of State
DOT	Department of Transportation
DPG	Defense Planning Guidance
DPM	Defense Priority Model
DQA	Data Quality Assessment
DQO	Data Quality Objective
DRE	Destruction and Removal Efficiency
DRMO	Defense Reutilization and Marketing Office
DRMR	Defense Reutilization and Marketing Region
DRMS	Defense Reutilization and Marketing Service
DSC	Data Screening Concentration
DSERTS	Defense Site Environmental Restoration Tracking System
DSMOA	DOD/State Memorandum of Agreement
DTSC	Department of Toxic Substances Control, State of California
DUSD(ES)	Deputy Under Secretary of Defense of Environmental Security
DWCDs	Drinking Water Criteria Documents
DWS	Drinking Water Standard
E	Exposure level
E (inorganic)	Estimated value. See Data Qualifiers
E (organic)	Indicates compound exceeded the calibration range for the GC/MS
E/P	Evaporation/Percolation
EA	Environmental Assessment
EA	Exposure Area

EBB	Electronic Bulletin Board
EBS	Environmental Baseline Survey
EBSL	Environmental Baseline Survey for Lease
EBST	Environmental Baseline Survey for Transfer
EC	Effective Concentration
EC ₅₀	Median Effect Concentration
ECD	Electron Capture Device
ECE	Environmental Compliance Evaluation
ECAO	Environmental Criteria and Assessment Office
E-CATS	Electronic Catalog System
ECOC	Ecological Contaminant of Concern
ED	Effective Dose
ED	Exposure Duration, year
ED ₅₀	Median Effect Dose
EDB	Ethylene Dibromide
EDD	Enforcement Decision Document
EDRS	Enforcement Document Retrieval System
EE	Engineering Evaluation
EEC	Environmental Effects Concentration
EE/CA	Engineering Evaluation/Cost Analysis
EF	Exposure Frequency, days/year
EFA	Engineering Field Activity
EFA CHES	Engineering Field Activity Chesapeake Division
EFA MW	Engineering Field Activity Midwest
EFA NW	Engineering Field Activity Northwest
EFD	Engineering Field Division
EFD LANT	Engineering Field Division Atlantic
EFD NORTH	Engineering Field Division Northern
EFD PAC	Engineering Field Division Pacific
EFD SOUTH	Engineering Field Division Southern
EFD SW	Engineering Field Division Southwest
EGW	Existing Groundwater Monitoring Well
Eh	Redox Potential
EHM	Extremely Hazardous Material
EHS	Extremely Hazardous Substance
EI/AA	Environmental Investigation and Alternatives Analysis

EIC	Engineer in Charge
EIS	Environmental Impact Statement
EL	Exposure Level
EM	Electromagnetic
EMAP	Environmental Monitoring and Assessment Program
EMMI	Environmental Monitoring Methods Index
EMSL	Environmental Monitoring System Laboratory
ENAN	Education Native American Network
ENRP	Environmental and Natural Resources Program
EO	Executive Order
EO	Explosive Ordnance
EOD	Explosive Ordnance Disposal
EOD	Engineering Operations Division
EP	Evaporation, Percolation
EP	Extraction Procedure
EPA	Environmental Protection Agency
EPAAR	EPA Acquisition Regulation Manual
EPACML	EPA's Composite Model for Landfills
EPC	Exposure point concentration
EPCRA	Emergency Planning and Community Right-To-Know Act
EPTC	Extraction Procedure Toxicity Characteristic
EQ	Environmental Quality
EQIS	Environmental Quality Information System
ER	Environmental Restoration
ER	Environmental Review
ER, N	Environmental Restoration, Navy
ERA	Ecological Risk Assessment
ERC	Emission Reduction Credit
ERD	Emergency Response Division
ERE	Ecological Risk Evaluation
ER-L	Effects Range-Low
ERL	Environmental Research Laboratory
ERL-C	Environmental Research Laboratory Corvallis
ERL/GB	Environmental Research Laboratory Gulf Breeze
ERLN	Environmental Research Laboratory Narragansett
ER-M	Effects Range-Median

ERNS	Emergency Response Notification System
ERP	Emergency Response Plan
ERT	Emergency Response Team
ERV	Ecotoxicity Reference Value
ESA	Endangered Species Act
ESC	(Naval Facilities) Engineering Service Center
ESC	Endangered Species Council
ESD	Emission Standards Division
ESDB	Endangered Species Database/Reach Scanlink
ESI	Expanded Site Inspection
ESR	Engineering Service Request
ESTC	Environmental Security Technology Certification (Program)
ET	Exposure Time, day/year
ETS	EPCRA 313 Tracking System
eV	electron Volts
EV	Event frequency
EZ	Exclusion Zone
F	Fahrenheit
F	Fluorine
F	Furnace AA. See Method Qualifier
FACTS	Facilities and Company Tracking System
FAR	Federal Acquisitions Regulations
FATES	FIRFA and TSCA Enforcement System (now known as SSTS)
FC	Fluorocarbons
FCOR	Final Closeout Report
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
Fe	Iron
FEE	Federal Environmental Executive
FEIS	Final Environmental Impact Statement
FEL	Field Equipment Log
FEMA	Federal Emergency Management Agency
FFA	Federal Facility Agreement
FFCA	Federal Facilities Compliance Act
FFIS	Federal Facilities Information System
FFS	Focused Feasibility Study

FFSRA	Federal Facility State Remediation Agreement
FGETS	Food and Gill Exchange of Toxic Substances
FGS	Final Governing Standards
FH	Foraging Habit
FHC	Fuel Hydrocarbon
FI	Fraction Ingested from source, unit-less
FIC	Facility Incident Commander
FID	Flame Ionization Device/Detector
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FINDS	Facility Index System
FIP	Final Implementation Plan
FIPS	Federal Information Processing Standards
FIS	Facilities Information System
FISC	Fleet and Industrial Support Center
FIT	Field Investigation Team
FK	Fish Kill (file within STORET)
FLP	Flash Point
FML	Flexible Membrane Liner
FNSI	Finding of No Significant Impact
foc	Fraction of Organic Carbon present in soil or sediment
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FORTRAN	Formula Translation (Computer Language)
FOSC	Federal On-Scene Coordinator
FOSL	Finding of Suitability for Lease
FOST	Finding of Suitability for Transfer
FOTW	Federally Owned Treatment Works
FP	Food Production
FPD	Flame Photometric Detector
FPR	Free Product Removal
FR	Federal Register
FR	Fraction of Food Item in Diet
FRC	Federal Records Center
FRDS	Federal Reporting Data System
FRP	Facility Response Plan
FS	Feasibility Study

FSP	Field Sampling Plan
ft	feet or foot
ft/ft	feet/foot
FTTA	Federal Technology Transfer Act
FUDS	Formerly Used Defense Sites
FWPCA	Federal Water Pollution Control Act (CWA)
FWQC	Federal Water Quality Criteria
FWS	(U.S.) Fish and Wildlife Service
FY	Fiscal Year
FYDP	Future Year Defense Plan
FYI	For Your Information
g	Gram. Metric unit of weight.
GAC	Granular Activated Carbon
GAO	General Accounting Office
GBERL	Gulf Breeze Environmental Research Laboratory
GC	Gas Chromatography
GCS	Geo-Common Subsystem (subsystem of AIRS)
GC/MS	Gas Chromatography/Mass Spectrometry
GCSOLAR	Green Cross Solar V1.1
GEMS	Graphical Exposure Modeling System
GETS	Groundwater Extraction and Treatment System
GICS	Grants Information and Control System
GIS	Geographic Information System
GISNET	Geographic Information Systems Bulletin Board
GLC	Gas Liquid Chromatography
GMP	Groundwater Monitoring Plan
GOCO	Government Owned/Contractor Operated
gpd	gallons per day
gpm	gallons per minute
GPO	Government Printing Office
GPR	Ground Penetrating Radar
GPS	Global positioning system
Gr°	standard Gibbs free energy
GRA	General Response Action
GRCDA	Governmental Refuse Collection and Disposal Association
GRIDS	Geographic Resources Information and Data System

GSA	General Services Administration
GW	Groundwater
GWM	Groundwater Monitoring
GWPS	Groundwater Protection Standard
GWTP	Groundwater Treatment Plant
GWTR	Ground Water Treatment Rule
H	Henry's Law Constant
H	Hydrogen
H&S	Health and Safety
H ₂	Hydrogen Gas
H _a	Alternative hypothesis
H _o	Null hypothesis
HA	Health Advisory
HADs	Health Assessment Documents
HAP	Hazardous Air Pollutant
HARP	Historic and Archeological Resources Plan
HASP	Health And Safety Plan
HAZMAT	Hazardous Material
HAZMIN	Hazardous Waster Minimization
HAZW	Hazardous Waste Collection Database (accessible through OLS)
HAZWASTE	Hazardous Waste
HAZWOPER	Hazardous Waste Operations and Emergency Response
HB	Hand Boring
HBL	Health Based Limit
HC	Hydrocarbons
HCFC	Hydrochlorofluorocarbon
HDPE	High Density Polyethelene
HE	High Explosive(s)
HEA	Health Effects Assessment
HEED	Health and Environmental Effects Documents
HEEP	Health and Environmental Effects Profiles
HEPA	High Efficiency Particulate Air (filter)
HERL	Health Effects Research Laboratory
HERL/MIS	Health Effects Research Laboratory Management Information System
Hg	Mercury
HHEM	Human Health Evaluation Manual

HHS	Housing and Human Services
HHS	Department of Health and Human Services
HI	Hazard Index
HICS	Hazardous Inventory Control System
HIT	Hazard Index, Total
HM	Hazardous Material
HMCM	Hazardous Material Control and Management
HM/HW C&M	Hazardous Material/Hazardous Waste Control and Management
HMIS	Hazardous Materials Information System
HMTA	Hazardous Material Transportation Act
HMTID	Hazardous Materials Turned in for Disposal
HMTIS	Hazardous Materials Turned in to Store
HMTR	Hazardous Materials Transportation Regulations
HMTUSA	Hazardous Material Transportation Uniform Safety Act
HMX	High Melting (or His Majesty's) Explosive
HNTS	Hydrocarbon National Test Site
HOC	Halogenated Organic Carbons
HPLC	High Performance Liquid Chromatography
HQ	Hazard Quotient
HQ	Headquarters
HRA	Historical Radiological Assessment
HRS	Hazardous Ranking System
HRS2	Revised Hazardous Ranking System
HS	Hazardous Substance
HS	Hydrogen Sulfide
HSCD	Hazardous Sites Control Division
HSL	Hazardous Substance List
HSM	Health and Safety Manager
HSP	Health and Safety Plan
HSPF	Hydrological Simulation Program
HSSM	Hydrocarbon Screening Spill Model
HSWA	Hazardous and Solid Waste Act Amendments (to RCRA)
HTIS	Hazardous Technical Information Services
HTW	Hazardous and Toxic Waste
HVAC	Heating, Ventilation, and Air Conditioning (System)
HW	Hazardous Waste

HWSFC	Hazardous Waste Superfund Collection
HWSFD	Hazardous Waste Superfund Database
HWDMS	Hazardous Waste Data Management System (now known as RCRIS)
I	Hydraulic Gradient
I	Intake
IAB	Information Access Branch
IAG	Interagency Agreement
IAM/SC	Initial Abatement Measures & Site Check
IAS	Initial Assessment Study
IAS	In Situ Air Sparging
IAQ	Indoor Air Quality
IAQINFO	Indoor Air Quality Information Clearinghouse
ICE	Internal Combustion Engine
ICP	Inductively Coupled Plasma
ICOLP	Industry Cooperative for Ozone Layer Protection
ICPIC	International Cleaner Production Information Clearinghouse
ICR	Incremental Cancer Risk
ICRE	Ignitability, Corrosivity, Reactivity, Extraction (Characteristics)
IC	Incident Commander
ICs	Institutional Controls
ICS	Incident Command System
ID	Inner Diameter
IDL	Instrument Detection Limit
IDLH	Immediately Dangerous to Life and Health
IDR	Initial Decision Report
IDW	Investigation Derived Waste
IDWM	Investigation Derived Waste Management
IFD	Industrial Facilities Discharge File (file within STORET)
IG	Inspector General
IGWMC	International Ground Water Modeling Center
IH	Industrial Hygienist
ILL	Interlibrary Loan
ILS	Integrated Logistic Support
IM	Interim Measures
IMB	Information Management Branch
IMSD	Information Management and Services Division

INRMP	Integrated Natural Resources Management Plan
IOCs	Inorganic Chemicals
IP/FP	Implementation Plan and Fee Proposal
IPMP	Integrated Pest Management Plan
IR	Infrared
IR	Ingestion Rate, mg/day, or Inhalation Rate
IR	Installation Restoration
IRA	Interim Remedial Action
IRC	Information Resource Center
IRI	Interim Remedial Investigation
IRIS	Integrated Risk Information System
IRM	Information Resources Management
IRP	Installation Restoration Program
IRTCC	Installation Restoration Technology Coordinating Committee
IS	Interim Status
ISC	Initial Site Characterization
ISC/FPR	Initial Site Characterization & Free Product Removal
ISI	Information Systems Inventory
ISIC	Immediate Supervisor in Command
ISO	International Standards Organization
ISSA	Inter-Service Support Agreement
ISV	In Situ Vitrification
ISV	In Situ Volatilization
ITER	Innovative Technology Evaluation Report
IVD	Ion Vapor Deposited
IWA	In Well Aeration
IWTP	Industrial Waste Treatment Plant
J	Estimated
JAG	Judge Advocate General
JE	Joint Engineers
JP-4	Jet Fuel 4
JP-5	Jet Fuel 5
JSA	Job Safety Analysis
JSF OIPT	Joint Strike Fighter Overarching Integrated Product Team
JURIS	Justice Retrieval and Inquiry System

K	Estimated, biased high (chemical data)
K	Hydraulic Conductivity
K	Potassium
K	Volatilization Constant
Kd	Diffusion coefficient
Koc	Organic Carbon Partition Coefficient
Kow	Octanol Water Partition Coefficient
KPEG	Potassium Polyethylene Glycol
L	Liter
L	Estimated, biased Low (chemical data)
LADD	Lifetime Average Daily Dose
LAER	Lowest Achievable Emission Rate
LAKE	Clean Lakes Database
LANTDIV	EFD Atlantic Division
LBP	Lead Based Paint
LC	Liquid Chromatography
LC ₅₀	Median Lethal Concentration
LC50	Lethal dose 50
LCC	Life Cycle Cost
LCLO	Lethal concentration low
LD	Land Disposal
LD ₅₀	Medial Lethal Dose
LDLO	Lethal dose low
LDR	Land Disposal Restrictions
LDS	Leak Detection System
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
LERAM	Littoral Ecosystem Risk Assessment Model
LFG	Landfill Gas
LFI	Limited Field Investigation
LI	Langelier Index
LLRW	Low Level Radioactive Waste
LNAPL	Light Non-Aqueous Phase Liquid
LOAEC	Lowest Observed Adverse Effects Concentration
LOAEL	Lowest Observed Adverse Effect Level
LOD	Limit of Detection

LOE	Lines-of-Evidence
LOEL	Lowest Observed Effects Level
LQAC	Laboratory Quality Assurance Coordinator
LRA	Land Re-use Authority
LRIP	Last Remedy in Place
LSI	Listing Site Inspection
LTM	Long Term Monitoring
LTMgt	Long Term Management
LTMP	Long Term Monitoring Plan
LTO	Long Term Operation
LTRA	Long-term Response Action
LUCs	Land Use Controls
LUFT	Leaking Underground Fuel Tank
LULU	Locally Undesirable Land Use
LUST	Leaking Underground Storage Tank
M	Duplicate injection precision not met
MAC	Maximum Allowable Concentrations
MACT	Maximum Achievable Control Technology
MANOVA	Multi Variate Analysis of Variance
MAP	Management Action Plan
MATC	Maximum Acceptable Toxic Concentration
MBCS	Modified Burmister Classification System
MBTA	Migratory Bird Treaty Act
MCCEM	Multi-Chamber Concentration and Exposure Model
MCETP	Marine Corps Environmental Training Program
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goals
MCO	Marine Corps Order
MCON	Military Construction, Navy
MCP	Monochlorophenol
MDE	Maryland Department of the Environment
MDL	Method Detection Limit
MEDLARS	Medical Literature Analysis and Retrieval System
MEK	Methyl Ethyl Keytone
MESO	Marine Environmental Support Office
MF	Modifying Factor

MF	Multiplication Factor
Mg	Milligram (1/1000, 10 ⁻³ , of a gram).
Mg	Magnesium
mg/kg	milligrams/kilogram
̄mg/kg	micrograms/kilogram
mg/kg/day	milligram/kilogram/day
̄mg/L (̄mg/l)	micrograms/liter - equivalent to ppb
mg/L (mg/l)	milligrams/liter - equivalent to ppm
mg/m ³	Milligram per cubic meter of air. mg/m ³
MGD	Million Gallons per Day
MHz	Megahertz
mi ²	square mile
MICE	Methods Information Communications Exchange
MILCON	Military Construction
MINTEQA2	Metal Speciation for Equilibrium for Surface and Ground Water
MIS	Management Information System
ml	Milliliter
mlw	mean low water
mm	millimeter
mm Hg	millimeters of mercury
mmhos/m	millimhos/meter
MMPA	Marine Mammal Protection Act
MMPA	Marine Mammal Protection Act Reauthorization
Mn	Manganese
MNA	Monitored natural Attenuation
Mo	Molybdenum
MOA	Memorandum of Agreement
MOD	Modification (Contracts/Plans)
MOFAT	Multi Phase Flow and Transport
MOU	Memorandum of Understanding
MP	Melting Point
MPCA	Minnesota Pollution Control Agency
MPF	Migration Pathway Factor
MPN	Most Probable Number
Mppcf	Millions of particles per cubic foot of air
MPR	Monthly Progress Report

MPRSA	Marine Protection, Research and Sanctuaries Act
MRL	ATSDR Minimal Risk Level
MS	Mass Spectrometry
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSD	Marine Sanitation Device
MSDS	Material Safety Data Sheet
MSL or msl	Mean Sea Level
MSW	Municipal Solid Waste
MVEL	(see NVFEL)
MW	Molecular Weight
MW	Monitoring Well
n-	"Normal-Used" as a prefix in chemical names signifying a straight-chain structure
n	Porosity
N	Nitrogen
N	Spiked sample recovery not within control limits
N/A	Not Applicable
Na	Sodium
NA	Natural Attenuation
NAAQS	National Ambient Air Quality Standards
NAB	Naval Amphibious Base
NABLC	Naval Amphibious Base Little Creek
NACIP	Navy Assessment and Control of Installation Pollutants
NADB	National Air Data Branch
NAEC	Naval Aviation Engineering Center
NAGPRA	Native American Graves Protection and Repatriation Act
NAPIS	National Agricultural Pest Information System
NAPL	Non-Aqueous Phase Liquid
NAPSIS	Navy Air Pollution Source Information System
NARL	National Air and Radiation Laboratory
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NATICH	National Air Toxics Information Clearinghouse
NAENVIRHLTHCEN	Navy Environmental Health Center
NAVFAC	Naval Facilities Engineering Command
NAVFACENGCOM	Naval Facilities Engineering Command

NAVOSH	Naval Occupation Safety and Health program
NAVPHIBASE	Naval Amphibious Base
NAVRAMP	Navy Radon Assessment and Mitigation Program
NAVSEASYSKOM	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NBS	National Biological Survey
NC	Not calculated as per protocols
NC	Notification of Closure
NCA	Noise Control Act
NCAT	National Catalog Database
NCC	National Climatic Center
NCC	National Computing Center
NCEA	National Center for Environmental Assessment
NCEL	Naval Civil Engineering Laboratory, now NFESC
NCIC	Non-Confidential Information Center
NCIS	Navy Criminal Investigation Service
NCLP	National Contract Laboratory Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NCP	National Contingency Plan
NCWQ	National Commission on Water Quality
ND	Non Detect
NDIR	Non-dispersive Infrared Analysis
NDPD	National Data Processing Division
NDWAC	National Drinking Water Advisory Council
ne or nef	Effective porosity for flow
NEBBS	Naval Environmental Bulletin Board System
NECIS	Naval Environmental Compliance Information System
NEDS	National Emission Data System (now known as AIRS)
NEESA	Naval Energy and Environmental Support Activity, now NFESC
NEHC	Navy Environmental Health Center
NEIC	National Enforcement Investigations Center
NEIT	Navy Environmental Inspection Team
NELP	Navy Environmental Leadership Program
NEPA	National Environmental Policy Act
NEPDB	Naval Environmental Protection Data Base
NEPMG	Navy Environmental Program Management Group

NEPSS	Naval Environmental Protection Support Service
NERRTS	Navy Environmental Regulatory Requirements Tracking System
NESC	National Environmental Supercomputing Center
NESHAP	National Emission Standard for Hazardous Air Pollutants
NETA	National Environmental Training Association
NEX	Naval Exchange
NFA	No Further Action
NFESC	Naval Facilities Engineering Service Center
NFPA	National Fire Protection Association
NFRAP	No Further Response Action Planned
NH4	Ammonium
NHPA	National Historic Preservation Act
Ni	Nickel
NIABY	Not in Anyone's Back Yard
NIMBY	Not in My Back Yard
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute for Standards and Technology (formerly NBS)
NLM	National Library of Medicine
NMFS	National Marine Fisheries Service (U.S. Dept. of Commerce)
NO	Nitric Oxide
NOAA	National Oceanic and Atmospheric Administration
NO2	Nitrite
NO3	Nitrate
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effect Level
NOEL	No Observed Effects Level
NOHSCP	National Oil and Hazardous Substances Contingency Plan
NOI	Notice of Intent
NON	Notice of Non-compliance
NORM	Naturally Occurring Radioactive Material
NORTHDIV	EFD Northern Division
NOSC	Naval Ocean Systems Center
NOSC	Naval On-Scene Coordinator
NOSCDR	Naval on-Scene Commander
NOTW	Navy Owned Treatment Works
NOV	Notice of Violation

NOX	Nitrogen Oxides
Nox	A general formula for oxides of nitrogen (NO,NO ₂)
NPDES	National Pollutant Discharge Elimination System
NPIRS	National Pesticide Information Retrieval System
NPL	National Priorities List
NPS	National Park Service (Dept. of Interior)
NPS	Nonpoint Sources
NPTN	National Pesticide Telecommunications Network
NR	The analyte is not required to be analyzed. See Method Qualifier
NRC	National Research Council
NRC	National Response Center
NRC	Nuclear Regulatory Commission
NRCS	National Resource Conservation Service (formerly Soil Cons. Service)
NRDA	National Resource Damage Assessment
NRDC	National Resources Defense Council
NRMP	Natural Resources Management Plan
NRT	National Response Team
NRT	National Resources Trustees
NSDWR	National Secondary Drinking Water Regulations
NSF	National Science Foundation
NSPS	New Source Performance Standards
NSY	Naval Shipyard
NTDB	National Trade Databank
NTIS	National Technical Information Service
NTP	Navy Training Plan
NTR	Navy Technical Representative
NVFEL	National Vehicle and Fuel Emissions Laboratory
NWI	National Wetland Inventory
NWS	Naval Weapons Station
O	Oxygen
O & M	Operations and Maintenance
O & M, MC	Operations and Maintenance, Marine Corps
O & M, N	Operations and Maintenance, Navy
O ₂	Oxygen Gas
O ₃	Ozone
OA	Office of the Administrator USEPA

OASN(I&E)	Office of the Assistant Secretary of the Navy (Installations and Environment)
OAQPS	Office of Air Quality Planning and Standards USEPA
OAQPSTTN	Office of Air Quality Planning and Standards Technology Transfer Network USEPA
OAR	Office of Air and Radiation USEPA
OARM	Office of Administration and Resources Management USEPA
OB/OD	Open burning/open detonation of munitions
OC	Office of the Comptroller USEPA
OCEPA	Office of Communications, Education, and Public Affairs USEPA
OCLC	Online Computer Library Center USEPA
OCM	Oil Content Monitor
OD	Outside Diameter
ODES	Ocean Data Evaluation System
ODP	Ozone Depletion Potential
ODS	Ozone Depleting Substance
ODS	Ozone Depleting Substance
ODU	Old Dominion University
ODUSD(ES)	Office of the Deputy Under Secretary of Defense, Environment and Security
OE	Office of Enforcement USEPA
OECD/SIDS	Organization for Economic Cooperation and Developments Screening Information Data Sets
OERR	Office of Emergency and Remedial Response
OESO	Ordnance Environmental Support Office
OGC	Office of the General Counsel
OHEA	Office of Health and Environmental Assessments
OHM/TADS	Oil and Hazardous Substances Technical Assistance Data System
OHS MSDS	Occupational Health Services Material Safety Data Sheets
OHW	Other Hazardous Waste
OIA	Office of International Activities USEPA
OIG	Office of Inspector General
OIRM	Office of Information Resources Management
OLA	Office of Legislative Affairs
OLS	Online Library System
OMB	Office of Management and Budget
OMMSQA	Office of Modeling, Monitoring Systems, and Quality Assurance
ONR	Office of Naval Research
OPA	Oil Pollution Act

OPM	Office of Personnel Management
OPN	Other Procurement, Navy
OPNAVINST	Chief of Naval Operations Instruction
OPNAVNOTE	Chief of Naval Operations Note
OPP	Office of Pesticide Programs USEPA
OPPE	Office of Policy, Planning, and Evaluation USEPA
OPPT	Office of Pollution Prevention and Toxics USEPA
OPPTS	Office of Prevention, Pesticides, and Toxic Substances USEPA
OPS	Operating Properly and Successfully
ORA	Oil Reclamation Area
ORC	Oxygen Release Compound
ORD	Office of Research and Development
ORO	Office of Regional Operations USEPA
ORP	Oxidation-Reduction Potential
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Act and/or Administration
OSQT	On-Scene Coordinator
OSW	Office of Solid Waste
OSWER	Office of Solid Waste and Emergency Response
OTI	Office of Technology Innovation
OTIS	Oklahoma Telecommunications Interlibrary System
OU	Operable Unit
OUST	Office of Underground Storage Tanks
OVA	Organic Vapor Analyzer
OW	Office of Water
OWEC	Office of Wastewater Enforcement and Compliance
OWPD	Office of Waste Programs Enforcement
OWS	Oil/Water Separator
P	Phosphorous
P	ICP
PA	Pollution Abatement
PA	Preliminary Assessment
PAC	Powdered Activated Carbon
PACDIV	EFD Pacific Division
PACM	Presumed Asbestos Containing Material
PAH	Polycyclic Aromatic Hydrocarbons

PAIS	Public Affairs Information Service
PAO	Public Affairs Officer
PARCC	Precision, Accuracy, Representativeness, Completeness, Comparability
PA/SI	Preliminary Assessment / Site Inspection
Pb	Lead
PC	Permeability Constant, cm/hr
PCB	Polychlorinated Biphenyl
PCC	Post Closure Care
PCDD	Polychlorinated Dibenzo-p-dioxin
PCDF	Polychlorinated Dibenzofuran
PCE	Perchloroethylene - also tetrachloroethene
PCi/L	Picocuries per Liter
PCOR	Preliminary Closeout Report
PCP	Pentachlorophenol / and Post closure plan
PCR	Pollution Control Report
PCS	Permit Compliance System
PDM 3.1	Probabilistic Dilution Model Version 3.1
PE	Performance Evaluation sample
PEF	Particulate Emission Factor
PEG	Polyethylene Glycol
PEL	Permissible Exposure Limit
PESTANV	Pesticide Analytical Model
PGRS	Plume Groundwater Recovery System
pH	Scale of 0 to 14 representing acidity or alkalinity (base) of aqueous solution
PHA	Public Health Assessment
PHI	Preliminary Hydrogeological Investigation
PHNC	Pearl Harbor Naval Complex
PIC	Products of Incomplete Combustion *
PIC	Public Information Center
PID	Photoionization Detector
PIES	Pollution Prevention Information Exchange
PIN	Pesticide Information Network
PIRU	Public Information Reference Unit
PL	Public Law
PM	Particulate Matter
PM	Project Manager

PM	Permit Modification
PM10	Particulate Matter smaller than 10 Microns
PMNs	Premanufacture Notifications
PNA	Polynuclear Aromatic hydrocarbons
PNRS	Preliminary Natural Resource Survey
Po	Polonium
POA&M	Plan of Action and Milestones
POC	Point of Contact
pOH	Indicates the hydroxide ion (OH-) concentration - basicity or acidity
POL	Petroleum, Oil and Lubricant
POM	Program Objective Memorandum
POTW	Publicly Owned Treatment Works
P2	Pollution Prevention
P2C3	Pollution Prevention, Cleanup, Compliance, Conservation
PPA	Pollution Prevention Act
Pox	A general term for the several oxides of phosphorus.
ppb	parts per billion
PPBS	Planning, Programming and Budgeting System
PPC	Personal Protective Clothing
PPE	Personal protective equipment
PPIC	Pollution Prevention Information Clearinghouse
PPL	Priority Pollutants List
ppm(v)	parts per million
ppt	parts per thousand
ppt	Parts per Trillion
PQL	Practical Quantitation Limit
PR	Preliminary Review
PRAP	Proposed Remedial Action Plan
PRASERS	Priority Risk Appraisal System for Environmental Restoration Studies
PRG, PRG _i , PRG _r	Preliminary Remediation Goals, industrial, residential
PRP	Potentially Responsible Party
PRZM	Pesticide Root Zone Model
PSC	Potential Source of Contamination
PSD	Prevention of Significant Deterioration
PSE	Preliminary Source Evaluation
PSH	Phase-Separated Hydrocarbon

psi	pounds per square inch
PSI	Preliminary Site Inspection
psia	Pounds per square inch absolute.
psig	Pounds per square inch gauge (i.e., above atmospheric pressure).
Pt	Platinum
PTB	Persistent, Toxic, Bioaccumulative (substance)
Pu	Plutonium
PVC	Polyvinyl Chloride
PWC	Public Works Center
PWD	Public Works Department
PZC	Point of zero charge
Q	No analytical result. See Data Qualifiers
Q	Volumetric flow rate
QA	Quality Assurance
QA	Quotient Approach
QA/QC	Quality Assurance/Quality Control
QAC	Quality Assurance Coordinator
QAMIS	Quality Assurance Management and Information System
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCI	Quality Control Index
QI	Qualified Individual
QL	Quantitation Limit
QRP	Qualified Recycling Program
QUAL2E	Enhanced Stream Water Quality Model
r	Correlation Coefficient
R	Rejected, data is not usable. See Data Qualifiers
R & D	Research and Development
RA	Remedial Action
RA	Removal Action
RA	Risk Assessment
RAB	Restoration Advisory Board
RA-C	Remedial Action Construction
RAC	Remedial Action Contract

RACER	Remedial Action Cost Engineering and Requirements
RACM	Reasonably Available Control Measure
RACMIS	Remedial Action Contracts Management Information System
RACT	Reasonably Available Control Technology
RACT/BACT/LAER	Reasonably Available Control Technology, Best Available Control Technology, and Lowest Achievable Emission Rate
RAG	Risk Assessment Guidance
RAGS	Risk Assessment Guidance for Superfund
RAO	Remedial Action Objective
RAO	Remedial Action Operation
RAP	Remedial Action Plan
RBC	Risk-Based Concentration
RBCA	Risk Based Corrective Action
RBSL	Risk Based Screening Level
RC	Response Complete
RCIS	Resource Center Information System
RCRA	Resource Conservation and Recovery Act, 1978
RCRIS	Resource Conservation and Recovery Act Docket Information System
RD	Remedial Design
RD&D	Research, Development, and Demonstration
RDDT&E	Research, Development, Demonstration, Test, and Evaluation
RDT&E	Research, Development, Test, and Evaluation
RDX	Research Dept (or Royal Demolition) Explosive
REAMS	Risk Exposure and Analysis Modeling System
REC	Regional Environmental Coordinator
REDOX	Reduction/Oxidation
RF	Radio Frequency
RF	Receptor Factor
RFA	RCRA Facility Assessment
RfC	Reference Concentration
RFC	Inhalation Reference Concentration
RfD	Reference Dose, Chronic
RfDdt	Reference Dose, Developmental
RfDi	Inhalation Reference Dose
RfDs	Subchronic Reference Dose
RFI	RCRA Facility Investigation
RFP	Request for Proposal

RGI	Benthic Macroinvertebrate Restoration Goal Index
RI	Remedial Investigation
RIC	Resource Conservation and Recovery Act Docket Information Center
RI/FS	Remedial Investigation/Feasibility Study
RILS	Regulatory Interpretation Letters
RIP	Remedy In Place
RITZ	Regulatory and Investigative Treatment Zone Model
RMAN	Recovered Materials Advisory Notice
RMCL	Recommended Maximum Contaminant Level
RME	Reasonable Maximum Exposure
RMIS	Restoration Management Information System
Rn	Radon
RO	Reverse Osmosis
ROD	Record Of Decision
RODS	Records of Decision System
ROICC	Resident Officer In Charge of Construction
RON	Record of Non-applicability
RPD	Relative Percent Difference
RPE	Remedial Project Engineer
RPM	Remedial Project Manager
RQ	Reportable Quantity
RQCAR	Reportable Quantities for Carcinogens in Hazardous Waste
RQTOX	Reportable Quantities for Chronically Toxic Hazardous Substances
RR	Rapid Response
RREL	Risk Reduction Engineering Laboratory
RRF	Relative Response Factor
RRSEM	Relative Risk Site Evaluation Model
RRT	Regional Response Team
RScan	ReachScan
RSD	Relative Standard Deviation
RSE	Remedial Site Evaluation
RSKERL	Robert S. Kerr Environmental Research Laboratory
RTM	Remedial Technical Managers
RTP	Research Triangle Park, North Carolina
RTKNet	Right-to-Know Network
RVS	Round 1 Verification Step

RWQCB	Regional Water Quality Control Board
s	value of draw down
S	Storage Coefficient
S	Sulfur
S (inorganic)	The reported value was determined by the Method of Standard Additions
S (organic)	Estimated due to surrogate outliers
S&GWI	Soil & Ground-water Investigation
S/S	Stabilization/Solidification
SA	Surface Area of exposed skin, cm ² /event
SAB	Science Advisory Board
SACM	Superfund Accelerated Cleanup Model
SAP	Sampling Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SAROAD	Superfund Chemical Analysis Data System (see CARD)
SAV	Submerged Aquatic Vegetation
Sb	Antimony
SB	Soil Boring
SB	Subsurface soil
SC	Site Closeout
SC	Site Check
SC	Site Characterization
SCAPS	Site Characterization Analysis and Penetrometer System
SCAQMD	South Coast Air Quality Management District (California EPA)
SCBA	Self-Contained Breathing Apparatus
SCEM	Site Conceptual Exposure Model
scfm	standard cubic feet per minute
SCLERAE	Tough, white, fibrous covering of the eyeball.
SCP	Spill Contingency Plan
SCRAM/BBS	Support Center for Regulatory Air Models, Bulletin Board System
SCS	Soil Conservation Service
SD	Standard Deviation
SDI	Subchronic Daily Intake
SDL	Sample Detection Limit
SDTS	Spatial Data Transfer Standards
SDWA	Safe Drinking Water Act
Se	Selenium

SEA	Supplemental Ecological Assessment
SEAM	Superfund Exposure Assessment Manual
SECNAV	Secretary of the Navy
SED	Sediment
SEDM	State/EPA Data Management
SEIS	Supplemental Environmental Impact Statement
SEM	Scanning Electron Microscope
SEP	Supplemental Environmental Project
SERC	State Emergency Response Council
SESO	Ships Environmental Support Office
SET	Source Emission Test
SET"	Solvated Electron Treatment
SEV	Screening Ecotoxicity Values
SF	Slope Factor
SF	Superfund
sf/day	square feet/day
SHML	Ship's Hazardous Material List
SHPO	State Historic Preservation Officer
Si	Silicon
SI	Site Investigation / Inspection
SIC	Standard Industrial Classification Code
SIDS	Screening Information Data Set
SIMA	Shore Intermediate Maintenance Activity
SIP	State Implementation Plan (air)
SIRMO	Senior Information Resource Management Officer
SITE	Superfund Innovative Technology Evaluation
SJA	Staff Judge Advocate
SLA	Special Libraries Association
SLR	State and Local Relations
SMDP	Scientific/Management Decision Point
SMO	Sample Management Office
SMP	Site Management Plan
SMSA	Standard Metropolitan Statistical Area
Sn	Tin
SNAP	Significant New Alternatives Program (for ODS replacement)
SNARL	Suggested No Adverse Response Level

SO ₂	Sulfur Dioxide
SOC	Synthetic Organic Chemical
SOFA	Status of Force Agreement
SOILVENT	Soil Venting Model
SONS	Spills of National Significance
SOP	Standard Operation Procedure
SOUTHDIV	EFD Southern Division
SOW	Scope of Work
Sox	Oxides of sulfur where x equals the number of oxygen atoms.
SPCC	Spill Prevention, Control, and Countermeasures
SPCC	System Performance Check Compounds
SQG	Small Quantity Generator
SQL	Sample Quantitation Limit
SQuiRT	Screening Quick Reference Tables
SR	Specific Retention
SRA	Screening Risk Assessment
SRF	State Revolving Fund (module of GICS)
SRIM	Selected Research in Microfiche
SRS	Simple random sampling
SS	Specific Storage Coefficient
SS	Site Supervisor
SS	Surface Soil
SSI	Screening Site Inspection
SSL	Sediment Screening Level
SSL	Soil Screening Level
SSO	Site Safety Officer
SSTL	Site Specific Target Level
STEL	Short Term Exposure Limit
STEV	Short-term exposure value.
STM	Short Term Measure
STN	Scientific and Technical Information Network
STORET	USEPA's Computer System for the Storage and Retrieval of Water Quality Data of US Waterways Parametric Data
STP	Site Treatment Plans
STP	Sewage Treatment Plant
SU	Site Use Factor
SUPSALVE	Supervisor of Salvage

SV	Sampling Visit
SVADA	see SOILVENT
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
SW	Surface Water
SWAG	Simulated Waste Access to Ground Water
SWANA	Solid Waste Association of North America
SWDA	Solid Waste Disposal Act
SWDIV	Southwest, Naval Facilities Engineering Command
SWEIS	Site-Wide Environmental Impact Statement
SWMM	Storm Water Management Model
SWMU	Solid Waste Management Unit
SWRQB	State Water Resources Control Board
SWSL	Surface Water Screening Level
SWTR	Surface Water Treatment Rule
SY	Specific Yield
SZ	Saturated Zone
t	time
T	Titrimetric
T	Transmissivity
TAG	Technical Assistance Grant
TAL	Target Analyte List
TAP	Technical Assistance Program
TAP	Toxic Air Pollutant
TAPP	Technical Assistance for Public Participation
TASL	Target Action Screening Level
TAT	Technical Applications Team
TBC	To Be Considered ARAR
TBD	Technical Background Document
TBT	Tributyltin
TC	Toxicity Characteristic
TCA	Trichloroethane
TCA	Total Cost Analysis
TCE	Trichloroethene, Trichloroethylene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure

TCP	Trichlorophenol
TDD	Telecommunication Devices for the Deaf
TDP	Technology Development Plan
TDS	Total Dissolved Solids
TEAM	Total Exposure Assessment Model
TeCP	Tetrachlorophenol
TEF	Toxicity Equivalence Factor
TEGD	Technical Enforcement Guidance Document
TEO	Total Extractable Organics
TEX	Toluene, Ethylbenzene and Xylene
THC	Total Hydrocarbons
THM	Trihalomethane
TI,	Technical Impracticability
TI	Thallium
TIC	Tentatively Identified Compound
TIO	Technology Innovation Office, EPA
TIPS	Technical Information Packages
TIU	Technical Information Unit
TKN	Total Kjeldahl Nitrogen
TI	Thallium
TL	Trigger Level
TLV	Threshold Limit Value
TLV-C	Ceiling Exposure Limit or maximum exposure concentration not to be exceeded under any circumstances
TLV-STEL	Short-term exposure limit or maximum concentration for a brief specified period of time
TLV-TWA	Time weighted average
TMV	Toxicity, Mobility, Volume
TNC	The Nature Conservancy
TNT	Trinitrotoluene
TOA	Trace Organic Analysis
TOC	Total Organic Carbon
TOX	Total Organic Halogens
TOX	Total Toxics
TPAH	Total Polycyclic Aromatic Hydrocarbons
TPD	Tons Per Day
TPH	Total Petroleum Hydrocarbons

TPQ	Threshold Planning Quantity
TQL	Total Quality Leadership
TQM	Total Quality Management
TRC	Technical Review Committee (now RAB)
TRDS	Text Retrieval Data System
TRI	Toxic Release Inventory
TRI-US	Toxic Release Inventory-User Support
TRPH	Total Recoverable Petroleum Hydrocarbons
TRV	Toxicity Reference Value
TSCA	Toxic Substance Control Act (pronounced TOSCA)
TSCATS	Toxic Substances Control Act Test Submissions Online Database
TSD	Treatment, Storage, and Disposal
TSDF	Treatment, Storage, and Disposal Facility
TSP	Total Suspended Particulates
TSS	Total Suspended (non-filterable) Solids
TVH	Total Volatile Hydrocarbons
TVPH	Total Volatile Petroleum Hydrocarbons
TWA	Time Weighted Average
U	Non-detect. See Data Qualifiers
U	Uranium
UBST	Underground Bulk Storage Tank
UCL	Upper Confidence Level
UEL	Upper Explosive Limit
UF	Uncertainty Factor
UFL	Upper Flammability Limit
µg/kg	Micrograms/kilogram
µg/L	Micrograms/liter
UIC	Underground Injection Control
UIC	Unit Identification Code
ULEV	Ultra-Low Emission Vehicle
UMTRCA	Uranium Tailings Radiation Control Act
UNEP	United Nations Environment Program
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USC	Unified Soil Classification
USC	United States Code

USCG	US Coast Guard
USCS	Unified Soil Classification System
USDA	US Department of Agriculture
USE	To package, handle, react, or transfer.
USEPA	US Environmental Protection Agency
USFS	US Forest Service (of USDA)
USFWS	US Fish and Wildlife Service (of DOI)
USGS	US Geological Survey
USNPS	US National Park Service
UST	Underground Storage Tank
UV	Ultraviolet
UXO	Unexploded Ordnance
UZ	Unsaturated Zone
V	Vanadium
VADEQ	Virginia Department of Environmental Quality
VC	Vinyl Chloride
VDEQ	Virginia Department of Environmental Quality
VDWM	Virginia Department of Waste Management
VF	Volatilization Factor
VHWMR	Virginia Hazardous Waste Management Regulations
VOA	Volatile Organic Analytes/Analysis
VOC	Volatile Organic Compound
VP	Vapor Pressure
VP	Verification Phase
VR	Virginia Regulation
VS	Flow Velocity
VS	Verification Study
VSI	Visual Site Inspection
VSS	Volatile Suspended Solids
VSWCB	Virginia State Water Control Board
VSWMR	Virginia Solid Waste Management Regulations
VX	Nerve agent
W	Post-digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance
W	Tungsten

WBS	Work Breakdown Structure
WESTDIV	EFD West Division – San Bruno, CA - No longer an active organization.
WIC	Washington Information Center
WL	Water table Level
WLN	Washington Library Network
WOE	Weight of Evidence
WP	Work Plan
WQAS	Water Quality Analysis System (file within STORET)
WQCB	Water Quality Control Board
WQCDs	Water Quality Criteria Documents
WQS	Water Quality Standard
WRS	Wilcoxon Rank Sum test
WSF	Water Soluble Fraction
WSM	Watershed Model
WSRA	Wild and Scenic Rivers Act
WTIE	Wastewater Treatment and Information Exchange
WTIE/BBS	WTIE Electronic Bulletin Board System
WWT	Wastewater Treatment
X	Alternate data flag. See Data Qualifiers
XRF	X-Ray Fluorescence
YTD	Year To Date
ZEV	Zero Emission Vehicle
Zn	Zinc



Remedial Investigation and Human Health Risk Assessment Paradise Creek Landfills

Presented to
NNSY RAB
November 15, 2001



Presentation Objective

- ◆ **Provide status of Scott Center Landfill and Paradise Creek Disposal Area Investigations**
- ◆ **Provide Summary of Scott Center Landfill Remedial Investigation**
- ◆ **Provide Summary of Scott Center Landfill Human Health Risk Assessment**
- ◆ **Discuss Next Steps in the CERCLA process for Scott Center Landfill and Paradise Creek Disposal Area**



- ◆ Paradise Creek Landfills
 - Scott Center Landfill (OU1 Site 2)
 - Paradise Creek Disposal Areas (OU2 Sites 3-7)
- ◆ Final Remedial Investigation for Scott Center Landfill submitted October 2001
- ◆ Remedial Investigation for Paradise Creek Disposal Area in progress
- ◆ Draft Ecological Risk Assessment for Paradise Creek submitted May 2001 in regulatory review



Summary of Scott Center Landfill Remedial Investigation

- ◆ Scott Center Landfill operated intermittently in late 1950s for disposal of waste from drydock operations
- ◆ Wastes disposed of included sand and abrasive blast grit, sanitary wastes and industrial residues
- ◆ Area of waste disposal is 1.7 acres
- ◆ Volume of waste and cover material is estimated to be between 9,000 and 16,000 cubic yards



Summary of Scott Center Landfill Remedial Investigation

◆ Objectives of Remedial Investigation

- Evaluate the nature and extent of site-related contaminants
- Assess potential current and future threats to human health
- Assess potential current and future threats to the environment
- Obtain data necessary to evaluate remedial action alternatives to mitigate risks



Summary of Scott Center Landfill Remedial Investigation

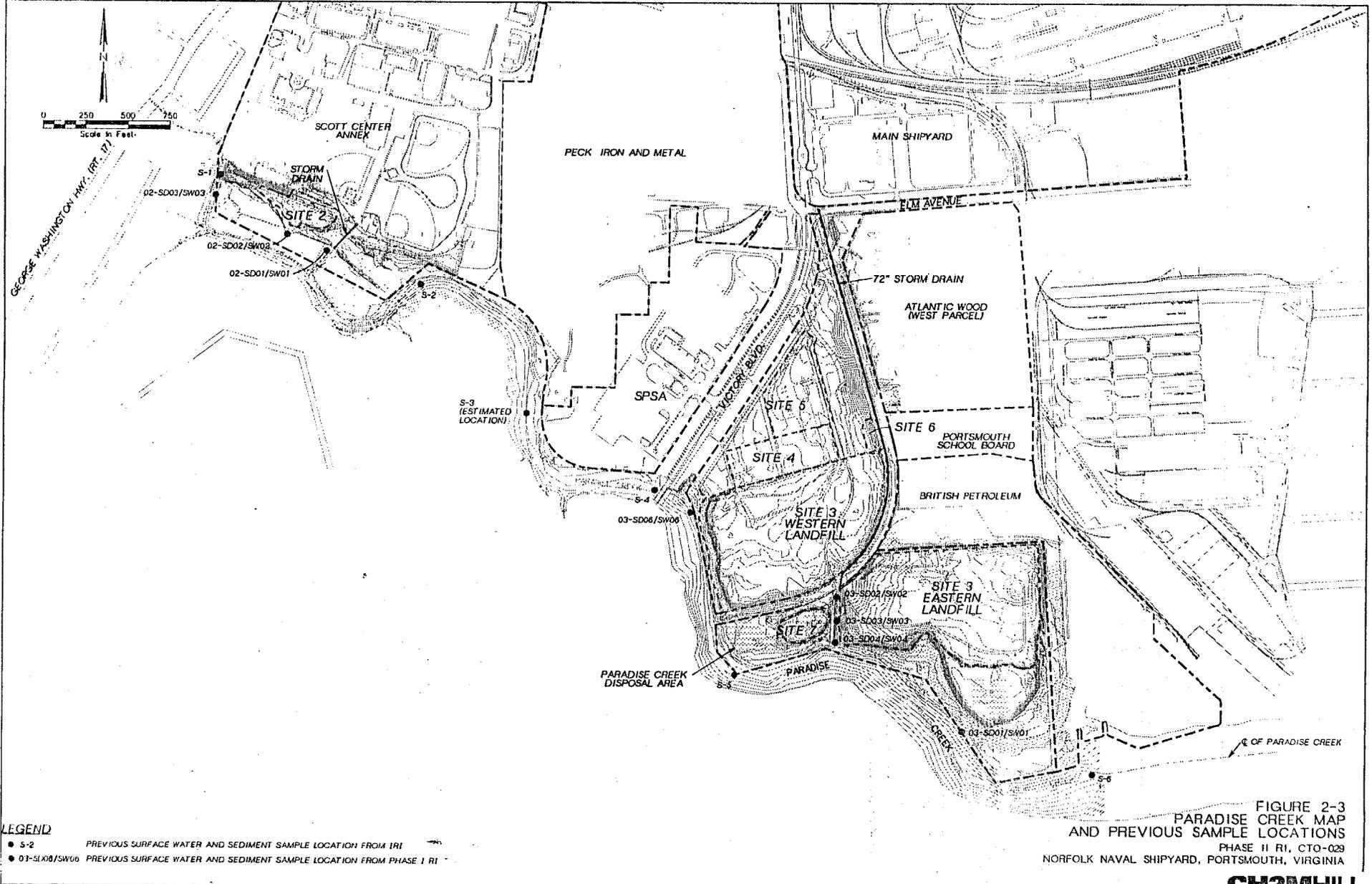
- ◆ Remedial Investigation included soil and groundwater sampling in vicinity of the landfill
- ◆ Surface water and sediment samples were collected as part of the Paradise Creek ecological risk assessment
- ◆ Human health and ecological risks associated with surface water and sediment will be incorporated into the RI for OU2 (Sites 3-7) and will address risks from both Scott Center Landfill and Paradise Creek Disposal Area



Summary of Scott Center Landfill Remedial Investigation

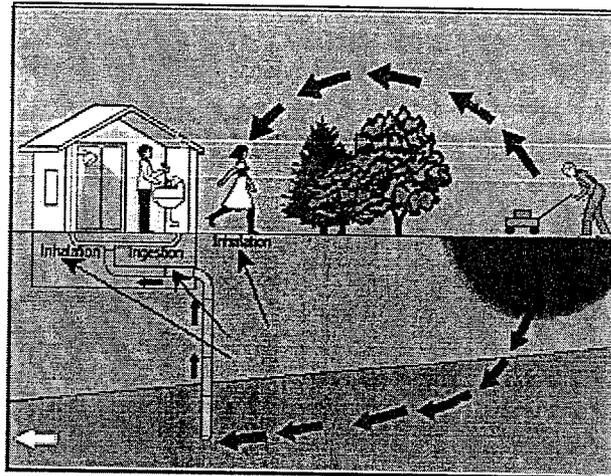
◆ Extent of Contamination Scott Center Landfill

- Concentrations of parameters in surface and subsurface soil elevated above background include some metals (lead, zinc, arsenic, and iron), polynuclear aromatic hydrocarbons (PAHs), and PCBs
- Concentrations of parameters in shallow groundwater that may be site-related are limited to some metals (zinc, nickel, arsenic, iron, and manganese)
- No impacts to groundwater in the deeper Yorktown Aquifer





Types of Exposure



Scott Center Landfill HHRA Summary

- Review of Risk Assessment
- Exposure Scenarios
- Contaminants of Potential Concern (COPCs)
- Summary of Risks



Exposure Scenarios for Site 2, Scott Center Landfill

Media	Exposure Route	Future						Current		
		Resident		Recreation		Industrial	Construction	Industrial	Recreation	
		Adult	Child	Adult	Child	Worker	Worker	Worker	Adult	Child
Surface Soil	Ingestion					X		X		
	Dermal					X		X		
	Inhalation									
Surface and Subsurface Soil	Ingestion	X	X	X	X	X	X			
	Dermal	X	X	X	X	X	X			
	Inhalation	X	X			X	X			
Groundwater (Yorktown Aquifer)	Ingestion	X	X							
	Dermal	X	X							
	Inhalation	X	X							
Groundwater (Columbia Aquifer)	Ingestion						X			
	Dermal						X			
	Inhalation						X			



COPCs for Site 2, Scott Center Landfill

Surface Soil	Surface/Subsurface Soil	Groundwater (Yorktown Aquifer)	Groundwater (Columbia Aquifer)
Aluminum	Aluminum	Manganese	Aluminum
Antimony	Antimony	Chloroform	Antimony
Arsenic	Arsenic		Arsenic
Beryllium	Beryllium		Cadmium
Chromium	Chromium		Chromium
Copper	Copper		Iron
Iron	Iron		Manganese
Lead	Lead		Nickel
Manganese	Manganese		Vanadium
Mercury	Mercury		Zinc
Nickel	Nickel		Chloroform
Vanadium	Vanadium		
Zinc	Zinc		
	Aroclor-1248		
	Aroclor-1254		
	Aroclor-1260		
	Benzo(a)pyrene		



Summary of Risks for Site 2, Scott Center Landfill

	Exposure Pathways							Non-Cancer Risk
	Cancer-Risk			Cancer Risk	Non-Cancer Risk			
	Inhalation	Ingestion	Dermal		Inhalation	Ingestion	Dermal	
<i>Surface Soil</i>								
Current Industrial Worker								
<i>Surface and Subsurface Soil</i>								
Future Industrial Worker Scenarios								
Future Residential Child								
Future Residential Adult								
Future Residential Age-Adjusted								
Future Construction Worker								
Future Recreational Child								
Future Recreational Adult								
<i>Groundwater (Yorktown Aquifer)</i>								
Future Residential Child								
Future Residential Adult								
Future Residential Age-Adjusted								

- no risks
 - contributes to total risk
 - potential for risk



Current Risk Results

- Industrial worker
 - No cancer risk
 - No non-cancer risk

	Exposure Pathways							Total Non-Cancer Risk
	Cancer Risk			Total Cancer Risk	Non-Cancer Risk			
	Inhalation	Industrial	Dermal		Inhalation	Industrial	Dermal	
<i>Soil</i>								
Current Industrial Worker		✓	✓	✓		✓	✓	✓

- no risks
 - contributes to total risk
 - potential for risk



Future Industrial Risks

- Industrial worker
 - No cancer risk
 - No non-cancer risk
- Construction worker
 - No cancer risk
 - Potential non-cancer risk present from soil and groundwater

	Exposure Pathways							
	Cancer Risk			Total Cancer	Non-Cancer Risk			Total Non-Cancer
	Inhalation	Ingestion	Dermal		Inhalation	Ingestion	Dermal	
<i>Soil</i>								
Future Industrial Worker Scenarios	✓	✓	✓	✓	✓	✓	✓	✓
Future Construction Worker	✓	✓	✓	✓	✓	✓	✓	✓
<i>Groundwater (Columbia Aquifer)</i>								
Future Construction Worker	✓	✓	✓	✓	✓	✓	✓	✓

	- no risks
	- contributes to total risk
	- potential for risk



Future Residential Risk

- Future residential child/future residential adult
 - No cancer risk
 - Non-cancer risk from both soil and groundwater
- Future residential age-adjusted
 - Potential cancer risk present from soil

	Exposure Pathways							
	Cancer Risk			Total Cancer Risk	Non-Cancer Risk			Total Non-Cancer Risk
	Inhalation	Ingestion	Dermal		Inhalation	Ingestion	Dermal	
<i>Soil</i>								
Future Residential Chld	✓	✓	✓	✓	✓	✓	✓	✓
Future Residential Adult	✓	✓	✓	✓	✓	✓	✓	✓
Future Residential Age-Adjusted	✓	✓	✓	✓	✓	✓	✓	✓
<i>Groundwater (Yorktown Aquifer)</i>								
Future Residential Chld	✓	✓	✓	✓	✓	✓	✓	✓
Future Residential Adult	✓	✓	✓	✓	✓	✓	✓	✓
Future Residential Age-Adjusted	✓	✓	✓	✓	✓	✓	✓	✓

	- no risks
	- contributes to total risk
	- potential for risk



Future Recreational Risk

- Future recreational child/adult
 - No cancer risk
 - No non-cancer risk

	Cancer Risk				Non-Cancer Risk			Total Non-Cancer Risk
	Cancer Risk	Cancer Risk	Cancer Risk	Total Cancer Risk	Inhalation	Ingestion	Dermal	
Future Recreational Child		✓	✓	✓		✓	✓	✓
Future Recreational Adult		✓	✓	✓		✓	✓	✓

	- no risks
	-contributes to total risk
	-potential for risk



Scott Center Landfill Next Steps

- ◆ **OU1 Feasibility Study (FS) will evaluate alternatives to mitigate risks in soil, groundwater, surface water and sediment**
- ◆ **The OU1 FS will be submitted as separate document following the completion of the Paradise Creek Disposal Area (OU2) RI and HHRA and the Paradise Creek ERA**
- ◆ **FS Preliminary Remediation Goals (PRGs) for human health are back calculated to identify contaminant levels causing potential risk**



Paradise Creek Disposal Area (Sites 3-7 OU2) Status Summary

- ◆ **Submitted Draft Final OU2 RI/HHRA July 2000 (regulatory review delayed pending completion of ERA)**
- ◆ **OU2 RI/HHRA will address Paradise Creek surface water/sediment data and using transects/concentration gradients to assess contribution to HHRA risks from the sites (OU1 and OU2)**
- ◆ **Identify HHRA risks for fish consumption in upper Paradise Creek (upstream of George Washington Highway)**
- ◆ **Identify HHRA risks for fish consumption in lower Paradise Creek (downstream of George Washington Highway)**



Paradise Creek Disposal Area (Sites 3-7 OU2) Status Summary

- ◆ Incorporated all of EPA's comments on Site 3 into a Final RI/HHRA for Paradise Creek Disposal Area
- ◆ Awaiting EPA's site-specific comments on Site 5 and Paradise Creek
- ◆ Incorporated all of sediment and surface water data collected as part of ecological risk assessment into the revised HHRA



Paradise Creek Disposal Area (Sites 3-7 OU2) Status Summary

- ◆ Working with EPA on input parameters for modeling human health risk from fish consumption
- ◆ As previously noted the risk from Scott Center associated with surface water and sediment will be included in the OU2 RI/HHRA
- ◆ Scott Center Landfill (OU1) HHRA to include the Fish Consumption scenario is estimated to be completed this year.