



What Can We Learn from Orphan Sites?

**Remediation Technologies Symposium 2013
Banff, Alberta
October 17, 2013**

What Can We Learn From Orphan Sites?

Presentation Overview

- Orphan Well Association
 - OWA and Reporting
 - Orphan Basics and Operations
- Reclamation Statistics
- Looking Ahead



Orphan Well Association

Senora Energy
00/10-13-038-15W4/0

What is the Orphan Well Association?

- The Orphan Well Association (OWA) is incorporated as a **not for profit** organization under the Alberta Societies Act.
- Our name, the Orphan Well Association is the registered trade name of the
Alberta Oil and Gas Orphan Abandonment and Reclamation Association (AOGOARA).
- We operate legally and financially separate from the Alberta Energy Regulator (AER) formerly the ERCB.

What is the Orphan Well Association?

- The OWA is a unique not for profit organization known as a **Delegated Administration Organization** or **DAO** which only exist in Alberta.
- DAOs are established whenever the government regulates the collection of funds for a specific activity, and then remits the funds to a separate not for profit organization to manage the funds.
- The OWA is established under provincial legislation, *Orphan Fund Delegated Administration Regulation* or **OFDAR** (AR45/2001).

What is the Orphan Well Association?

Examples of DAOs

- Alberta Beverage Container Recycling Corporation
recycles beverage containers.
(DAO to Alberta Environment-ESRD)
- Alberta Recycling Management Authority
recycles paint, electronics, and tires.
(DAO to Alberta Environment-ESRD)
- Alberta Real Estate Foundation
funds low income housing projects.
(DAO to Service Alberta)

What does the OWA do?

- Orphan Well Association
Abandon and reclaim orphan wells, pipelines and facilities
(DAO to Alberta Energy Regulator or AER)

OWA Mandate is

to manage the abandonment of Alberta upstream oil and gas orphan wells, pipelines and facilities and the reclamation (including remediation) of their associated sites.

How does the OWA operate?

- The OWA is governed by a board of directors
 - Canadian Association of Petroleum Producers, CAPP
 - Explorers and Producers Association of Canada, EPAC
 - AER and ESRD (20% government allowed by AG)
- We sublease office space and computer services from the AER.
- Operations started in April 1 2002.
- We have collected 11 years of reclamation statistics as of March 31, 2013.

OWA Reporting

The OWA is required by OFDAR to submit to the AER:

- **Annual budget and three year business plan**
90 days before start of each fiscal year (by Dec 31).
- **Annual report**
within 180 days of year end (by Sep 30).

OWA Reporting



**Orphan Well
Association**

Alberta Oil and Gas Orphan Abandonment and Reclamation Association

Orphan Well Association

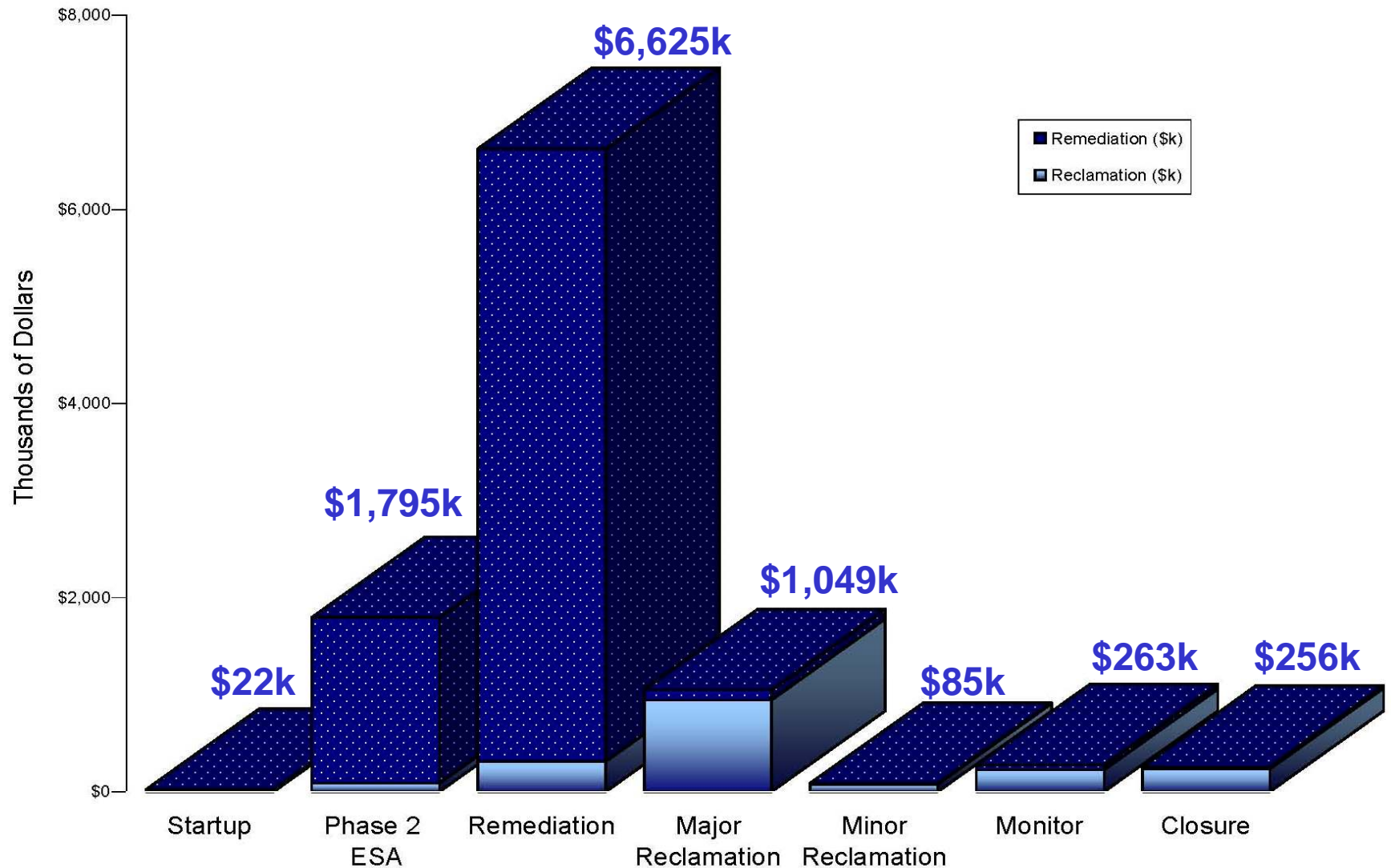
2012/13 Annual Report

June 2013

Visit our website www.orphanwell.ca to find

- Annual reports,
- List of orphan wells and orphan sites,
- Lists of defunct/insolvent companies and expenditures to date, and
- OWA contact information.

2012 Site Reclamation Costs by Category



OWA Reporting

The OWA is required by OFDAR to provide additional information on request by industry and by the AER, such as

- **Annual performance measures** for the AER to submit to the Auditor General and
- **Total Cost per Operator** values for industry which tracks total historical expenditures by licensee. Posted on OWA website.

This additional information is the source of our reclamation statistics in this presentation.

OWA Reporting

Top Ten Licensees by Expenditures

Licensee Name	Abandonment \$ to Date	Reclamation \$ to Date	Licensee \$ to Date
Big Valley Energy Corporation	1,476,075.86	17,158,681.56	18,634,757.42
Legal Oil & Gas Ltd.	2,036,965.84	15,397,504.58	17,434,470.42
Legacy Petroleum Ltd.	2,844,879.07	11,319,420.30	14,164,299.37
South Alberta Energy Corp.	1,004,787.81	6,976,137.21	7,080,925.02
Condor Resources Inc.	2,982,031.04	6,836,934.65	9,818,965.69
Bridges Energy Inc.	1,773,939.52	3,818,526.89	5,592,466.41
Katana Resources Ltd.	1,279,125.35	3,364,712.81	4,643,838.16
Provost Petroleums Ltd.	365,099.16	2,028,034.55	2,393,133.71
Kyjo Resources Ltd	1,460,280.67	1,554,283.25	3,014,563.92
Joffre Oils Ltd.	916,250.31	1,526,191.89	2,442,442.20
Totals	15,239,434.63	69,980,427.69	85,219,862.32

Orphan Basics

TRUE OR FALSE?

“An orphan is a well, pipeline, facility or associated site left with no one to pay for the cleanup.”

Regulators have committed to taking every reasonable effort to first investigate potential orphans

for a legally responsible and financially viable party before a property is designated as an orphan.

Is this an orphan well?



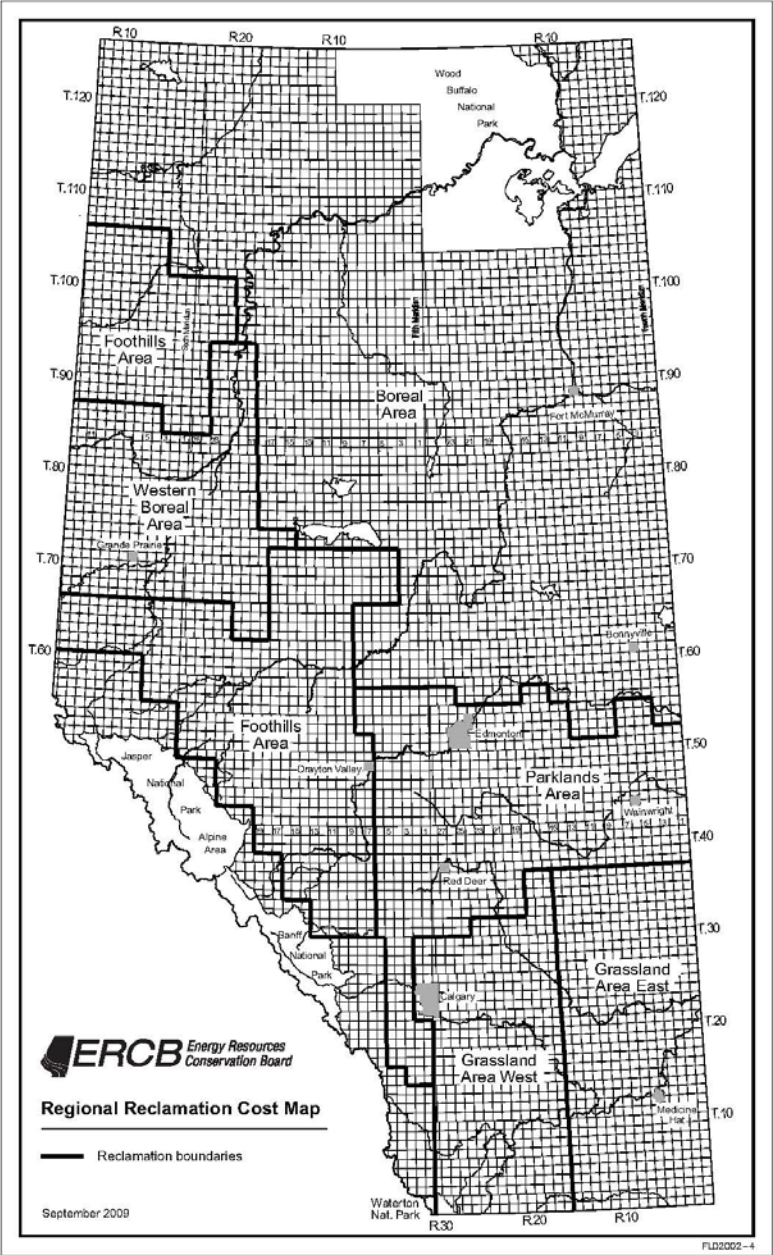
*Canadian Industrial Gas Limited
00/07-35-055-25W4/0
Ajax Morinville No. 9*

Orphan Basics – The Orphan Fund

The Orphan Fund is an annual levy collected by the AER from the Alberta upstream oil and gas industry which is then remitted to the OWA.

Each company is levied an amount based on the AER's Licensee Liability Rating (LLR) system which is administrated by the AER Liability Management Group.

See AER **Directive 006**, Directive 011 and Bulletin **2013-09** for updates.



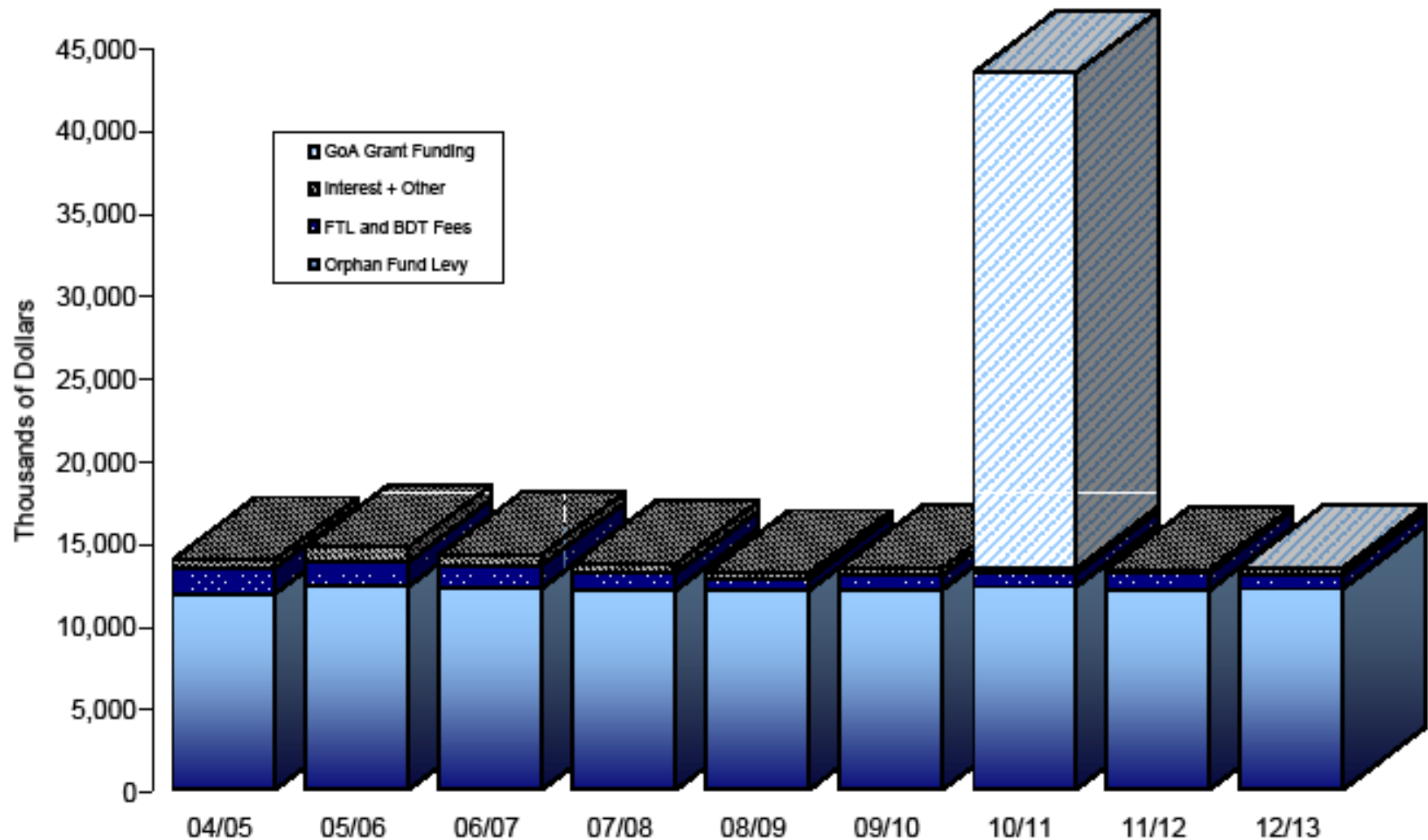
Directive 006

Regional Reclamation Cost Map

AER Bulletin 2013-09
25% increase in May 2014

Grasslands Area East	\$13,200
Grasslands Area West	\$20,200
Parklands Area	\$21,800
Foothills Area	\$23,400
Alpine Area	\$33,700
Western Boreal Area	\$27,200
Boreal Area	\$19,100

Figure 1 Historical Summary of Funding



What We Do - OWA Operations



**Orphan Well
Association**

**THIS SITE UNDER THE MANAGEMENT OF THE
ORPHAN WELL ASSOCIATION. FOR INFORMATION
PLEASE CALL (403)297-6416 DURING OFFICE HOURS**

CONDOR RESOURCES INC.

CONDOR ET AL

10-19-48-08-W5M

780-621-1711

What We Do - OWA Organization

Office Staff

- Manager and Administrator
- Coordinators
 - One Abandonment Coordinator
 - Two Environmental Coordinators
 - One Environmental Specialist – part time

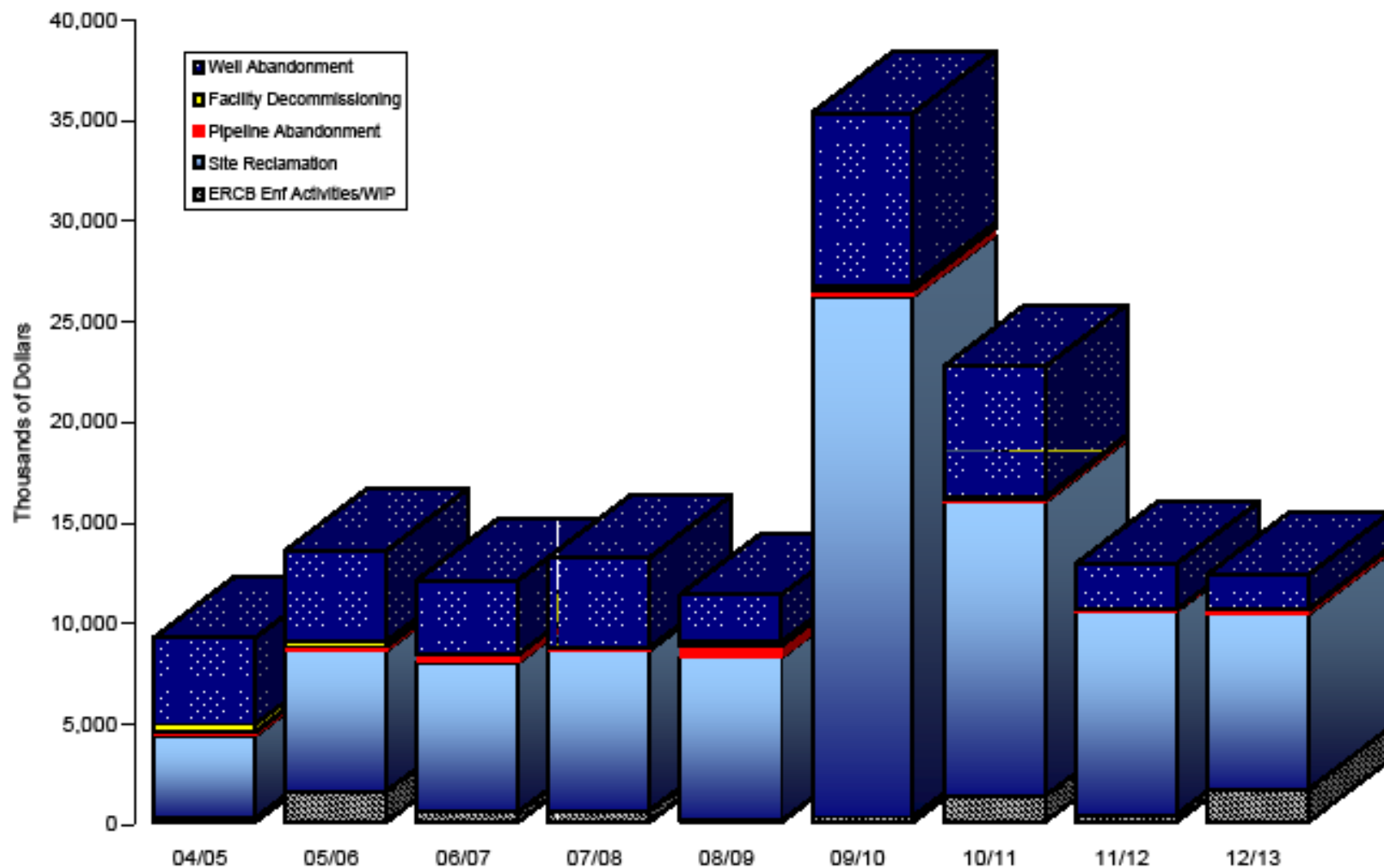
Consultants

- Abandonment Companies - Turnkey
- Environmental Companies – provide project management and field supervision, interact with landowners

Contractors



Figure 2 Historical Summary of Operating Expenditures



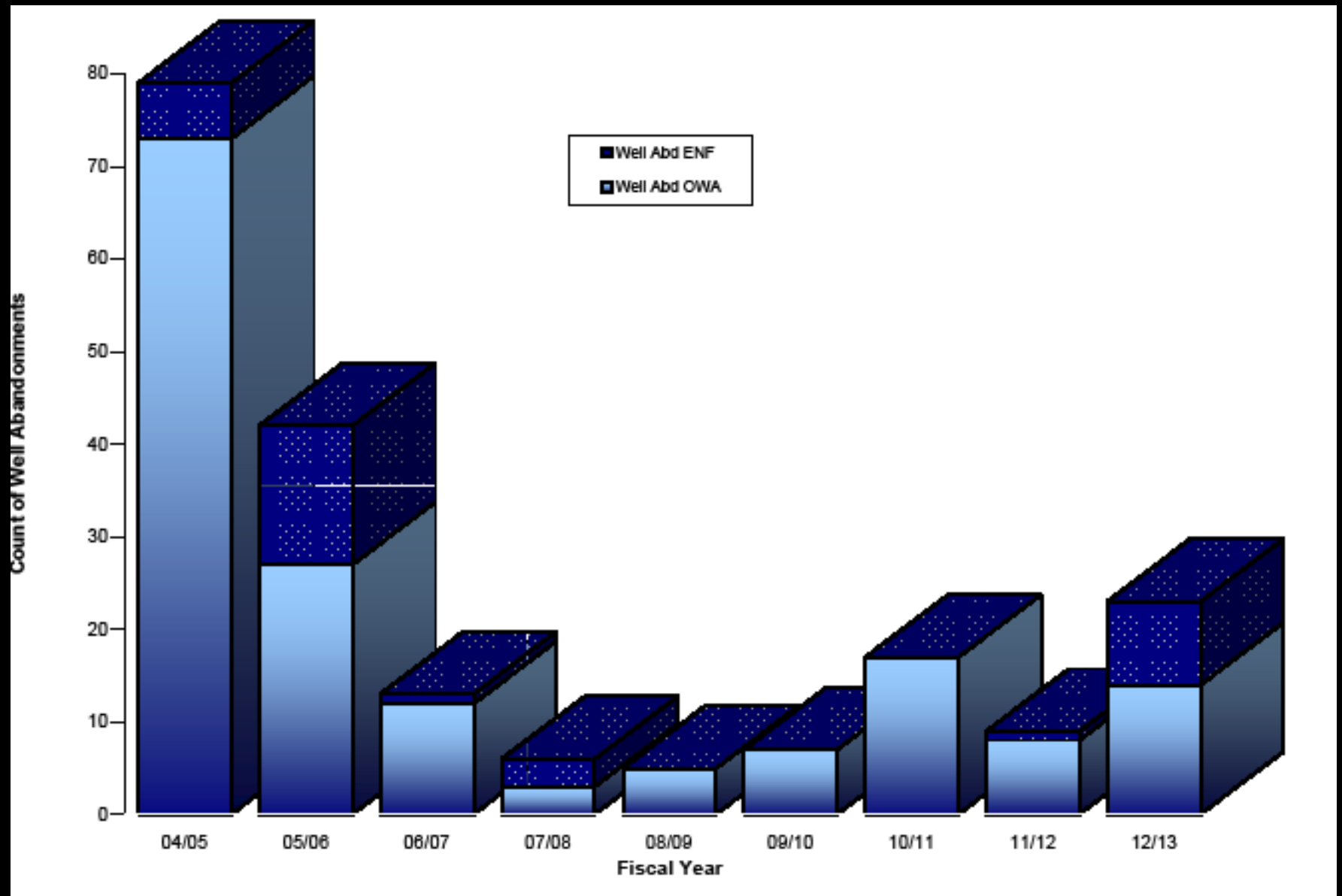
Orphan Well Abandonments

Well Abandonment Expenditures*	\$56,843,000
Number of Wells Abandoned*	606
Number of Wells Remaining To be Abandoned*	74
Estimated Expenditures to Complete Abandonment Work**	\$11,335,000

*As of Mar 31, 2013.

**As of Sep 30, 2013.

Figure 3 Well Abandonment Count



Tidy wells to abandon



Messy wells to abandon





Facilities to decommission

Infrastructure to remove



Pipelines to abandon



11/29/2011

A photograph of a field of tall, green grass with some dried, tan-colored seed heads. In the center of the field, there is a small, orange and black survey marker. In the background, a dense forest of tall evergreen and deciduous trees is visible under a cloudy sky. A dirt path or road runs along the edge of the field on the right side.

***Our mandate includes reclamation to
obtain Reclamation Certificates.***

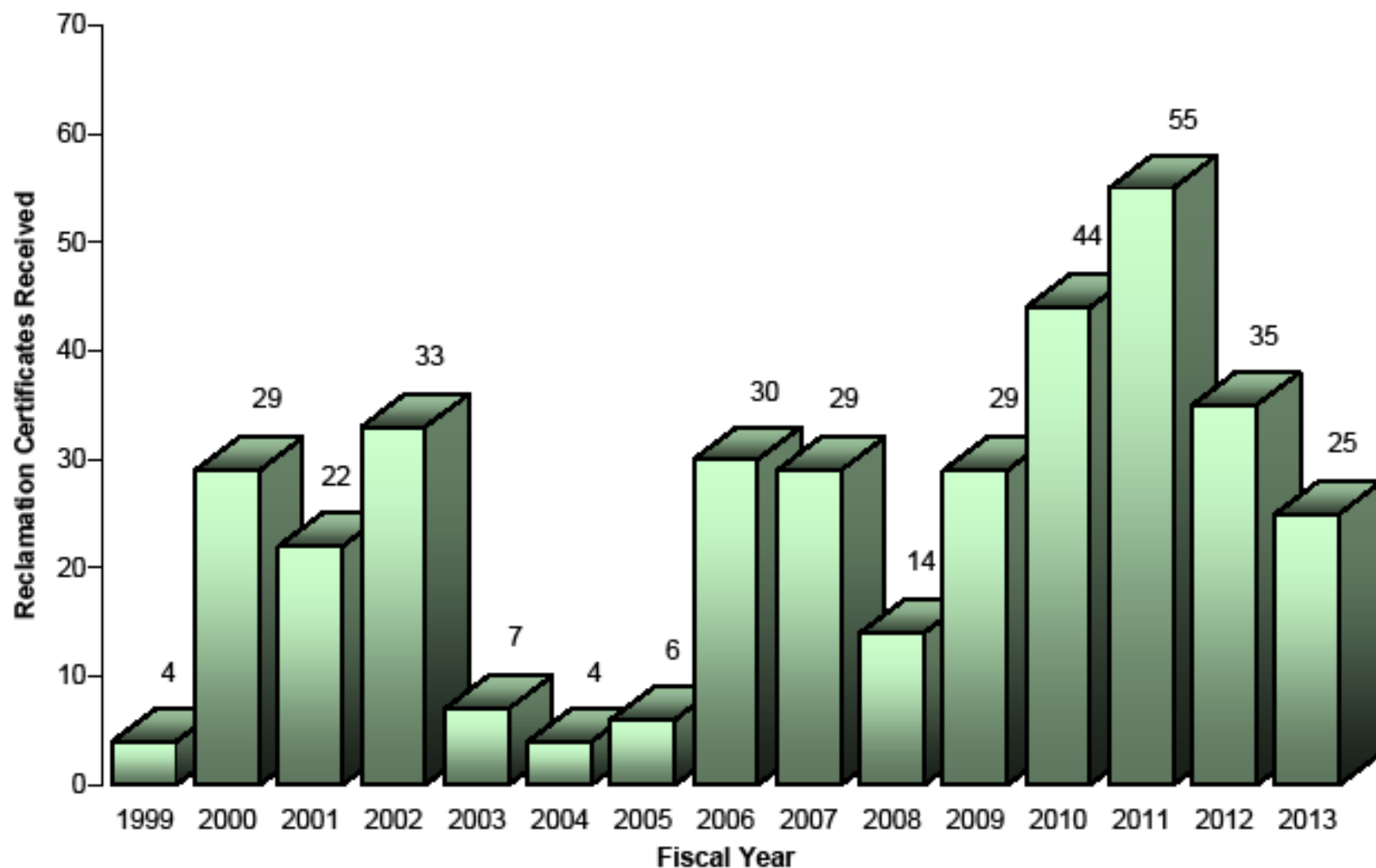
Orphan Site Reclamation

Reclamation Expenditures To Date*	\$109,367,000
Number of Sites obtained RC (368) and Handled (80)*	448
Number of Sites Remaining To Be Reclaimed*	360
Estimated Expenditures to Complete Reclamation**	\$96,278,000

*As of Mar 31, 2013.

*As of Sep 27, 2013, not including sites waiting on well abandonment.

Figure 4 Count of Reclamation Certificates Received



Reclamation Process

- Phase 1 – historical file review, landowner interview
- Phase 2 – intrusive site investigation
- Remediation – deal with impacts, well centres, spills, flare pits, drilling sumps, as per ESRD
- Reclamation – re-contour landscape, restore drainage, replace topsoil, re-vegetate
- Monitor re-establishment of vegetation
- Detailed Site Assessment of soils and vegetation
- Apply for Reclamation Certificate



Big Valley Energy 00/03-19-048-20W4/0
Stripping Topsoil



Big Valley Energy 00/10-06-048-20W4/0
Removal of Underground Storage Tank



Legal Oil and Gas 00/11-31-049-26W4/0
Remedial Excavation



Gammon Resources 00/13-21-043-22W4/0
Remedial Excavation



Big Valley Energy 00/02-07-048-20W4/0
Produced Water Impacts



Big Valley Energy 00/02-07-048-20W4/0
Petroleum Hydrocarbon Impacts



Big Valley Energy 00/12-06-048-20W4/0
Screening Rocks from Topsoil



Big Valley Energy 00/03-19-048-20W4/0
Seeding



Big Valley Energy 00/03-19-048-20W4/0
Reclaimed Site



New McDougal-Segur 02/11-12-020-03W5/0



Phoenix Resources 00/10-18-051-07W5/0



Gammon Resources 00/13-21-043-22W4/0



Legacy Petroleum Facility 08-29-021-14W4/0

Environmental Consulting



What my friends think I do



What Society thinks I do



What Government thinks I do



What my Clients think I do



What I think I do

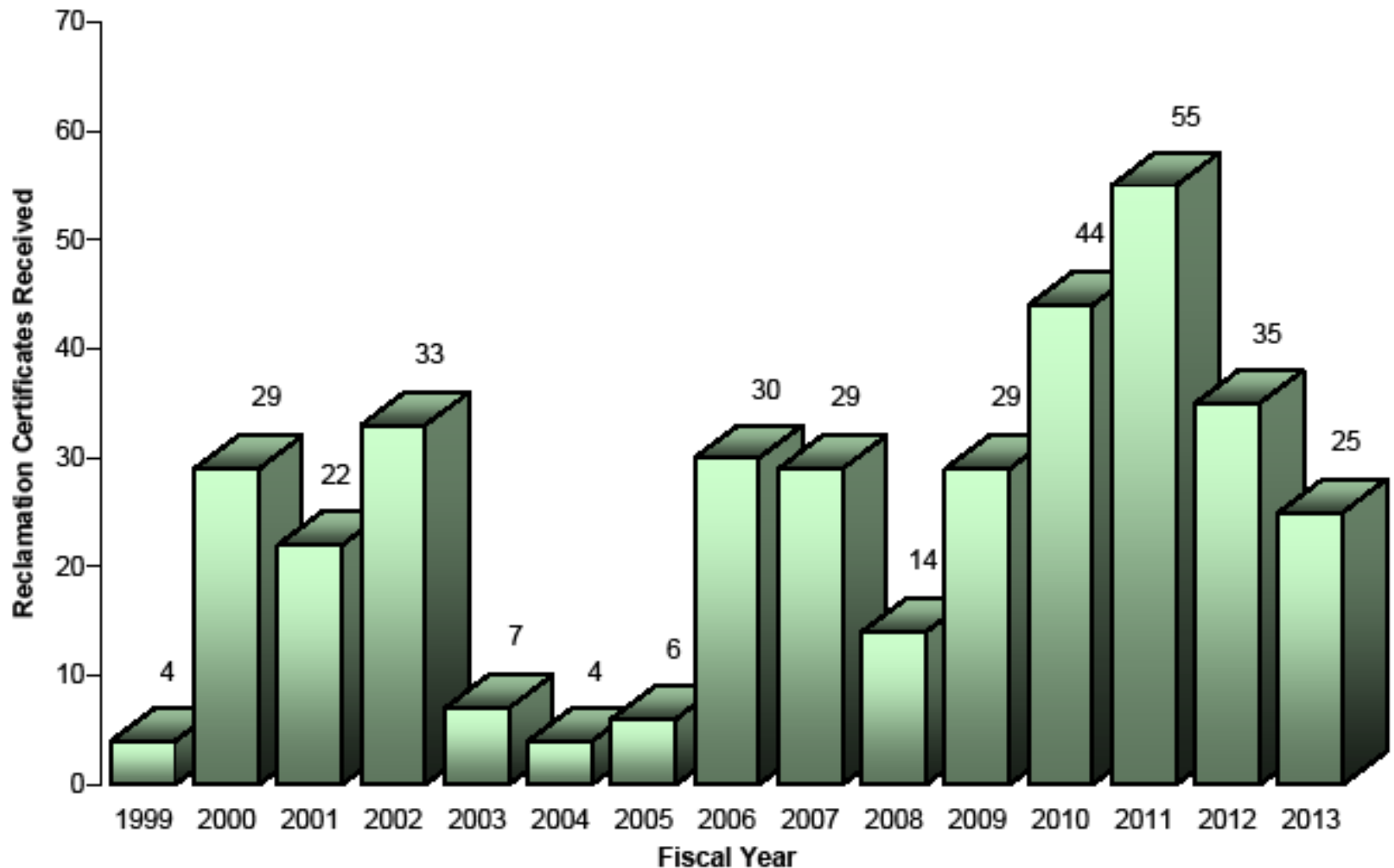


What I do

Reclamation Statistics



Figure 4 Count of Reclamation Certificates Received



Reclamation Statistics

to Obtain Reclamation Certificate by Fiscal Year

Figure 5 Average Total Costs

Figure 6 Cost Histogram – Cost per Site

Figure 7 Average Number of Years

Figure 8 Time Histogram – Years per Site

Figure 9 Time Histogram – Days per Site
to Obtain Reclamation Certificate from ESRD

Figure 5 Average Total Costs to Obtain Rec Cert by Fiscal Year

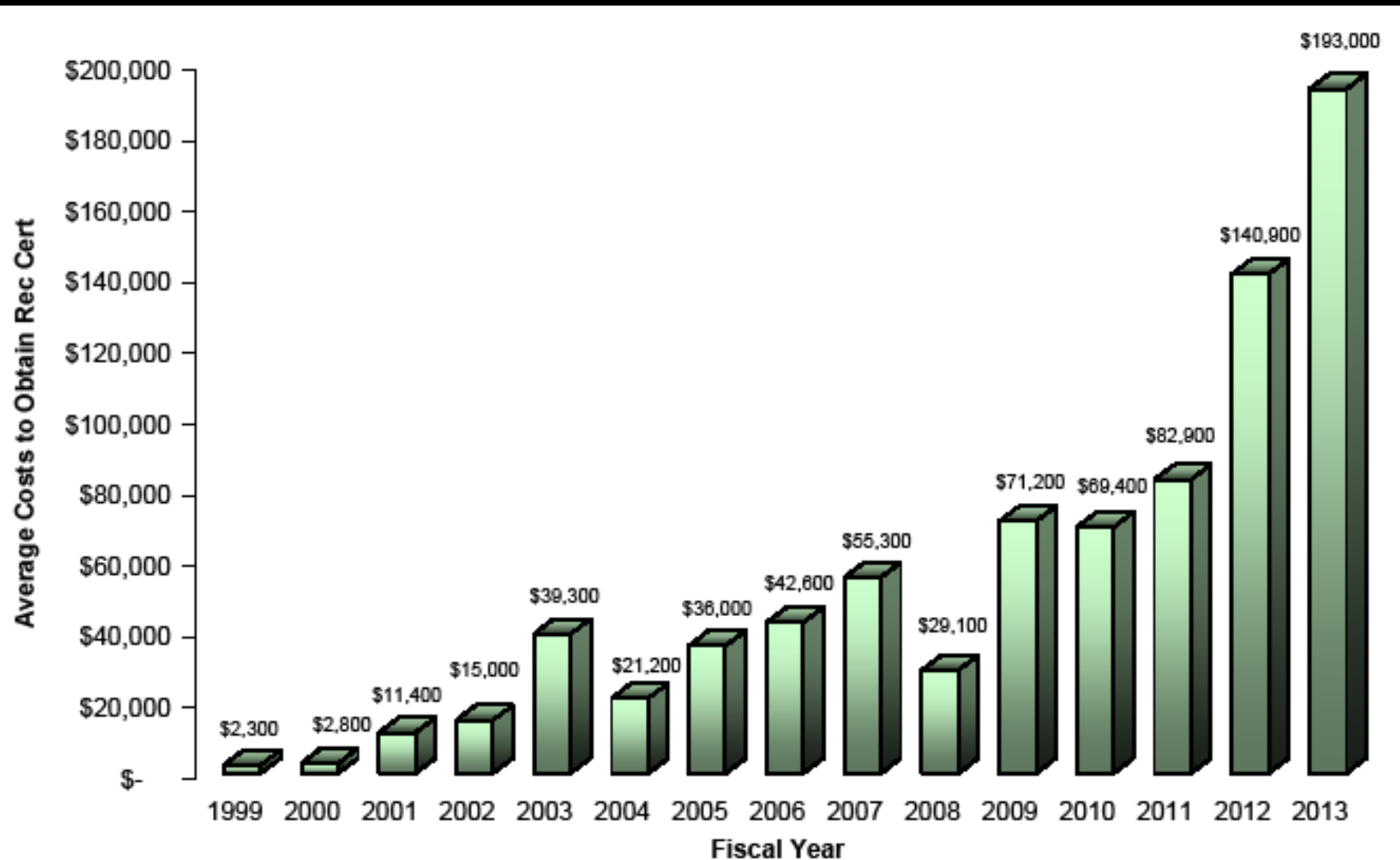
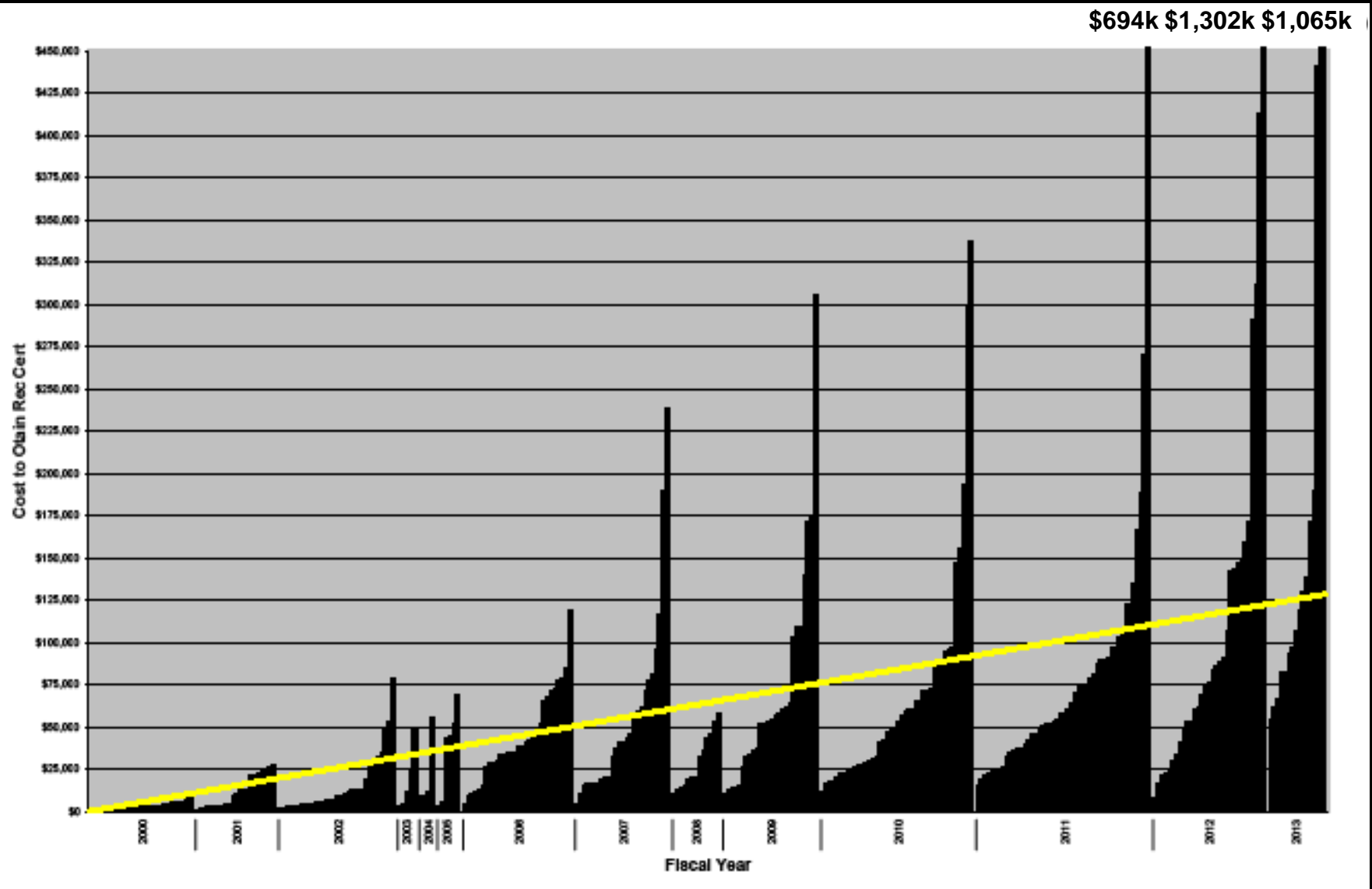


Figure 6 Cost Histogram - Cost per Site to Obtain RC by Fiscal Year



Joffre Oils Ltd.
00/14-35-014-01W5/0
\$1,209,000 Remediation



Figure 7 Average Number of Years to Obtain Rec Cert by Fiscal Year

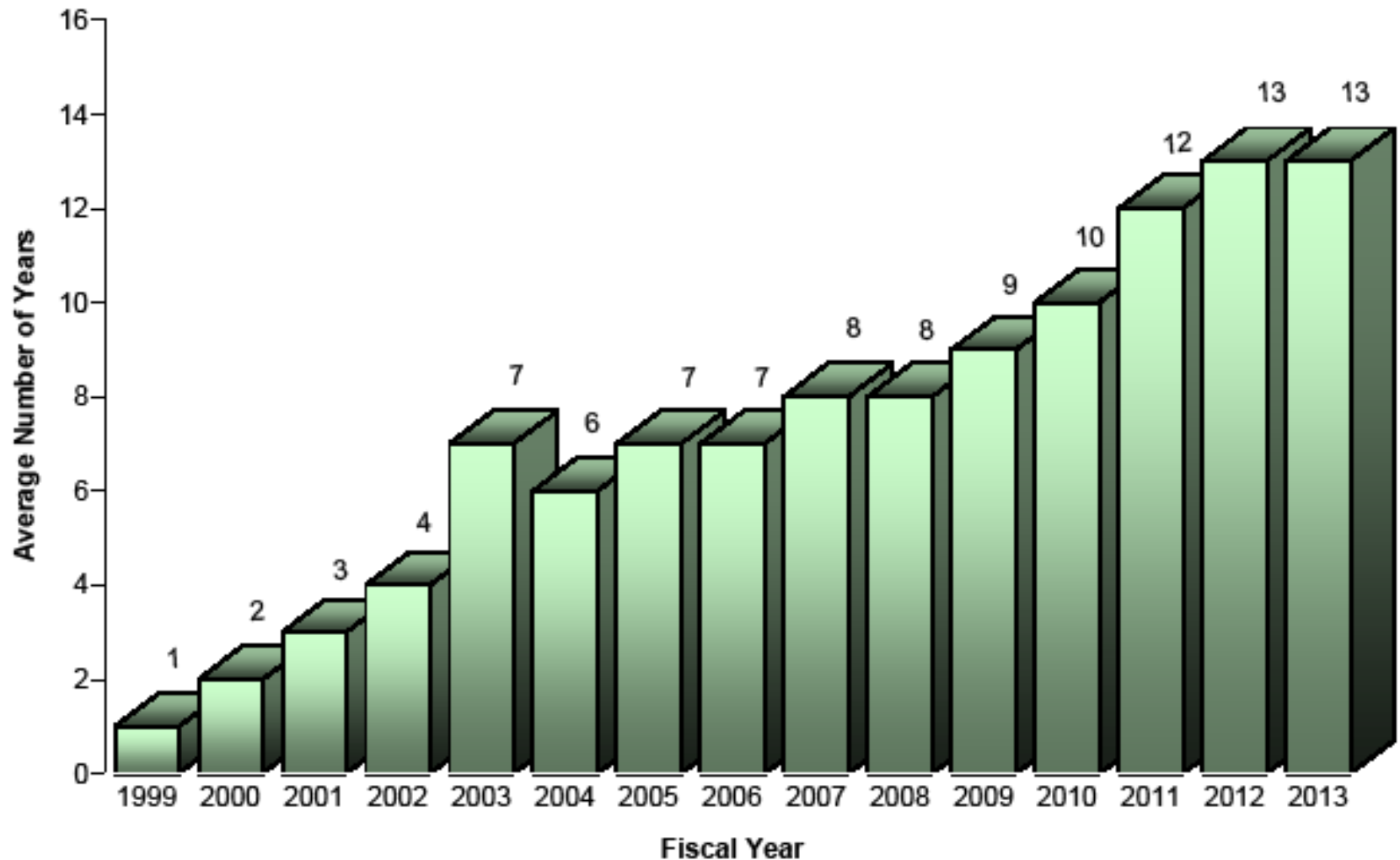
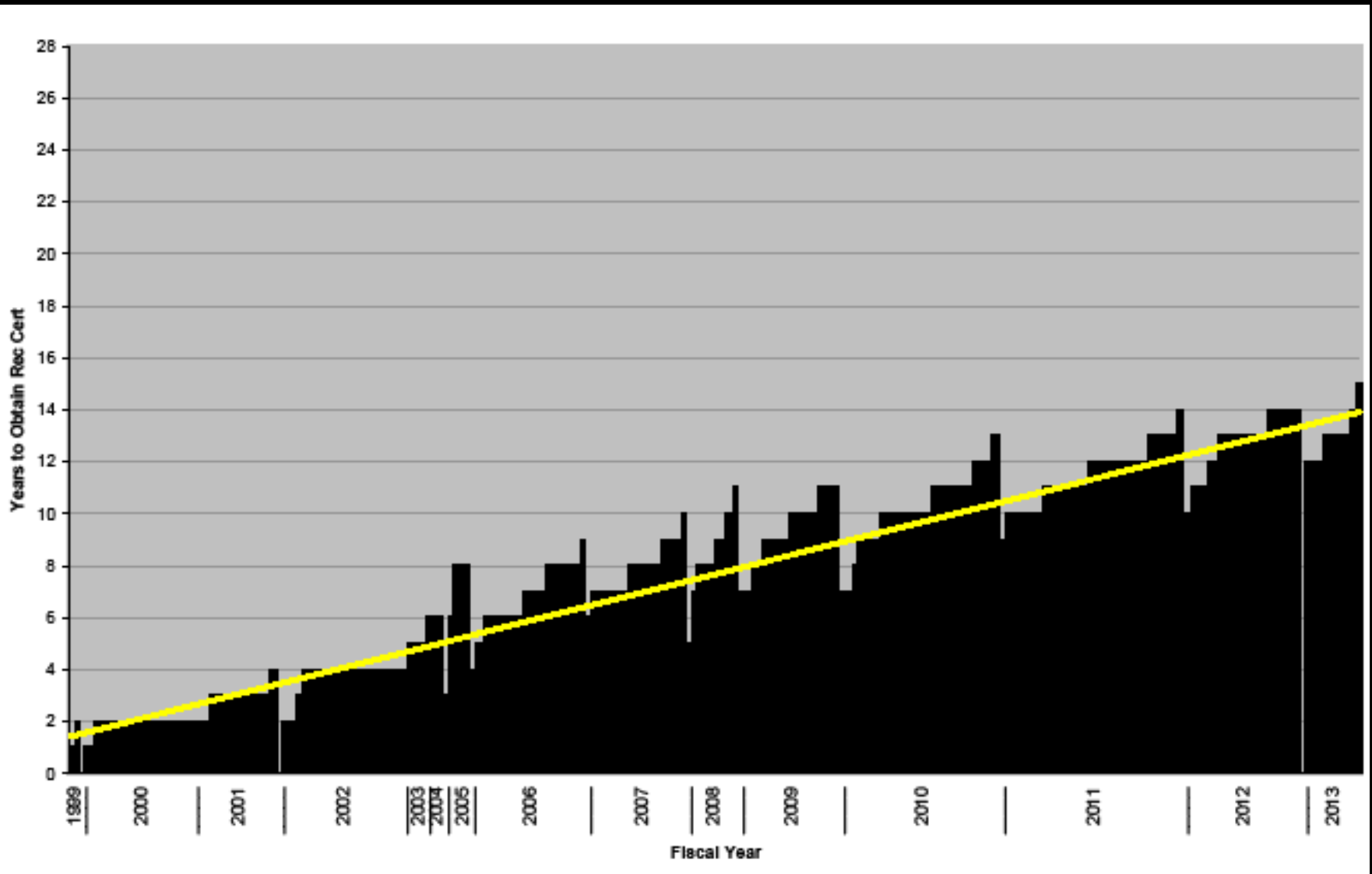


Figure 8 Time Histogram – Years per Site to Obtain RC by Fiscal Year





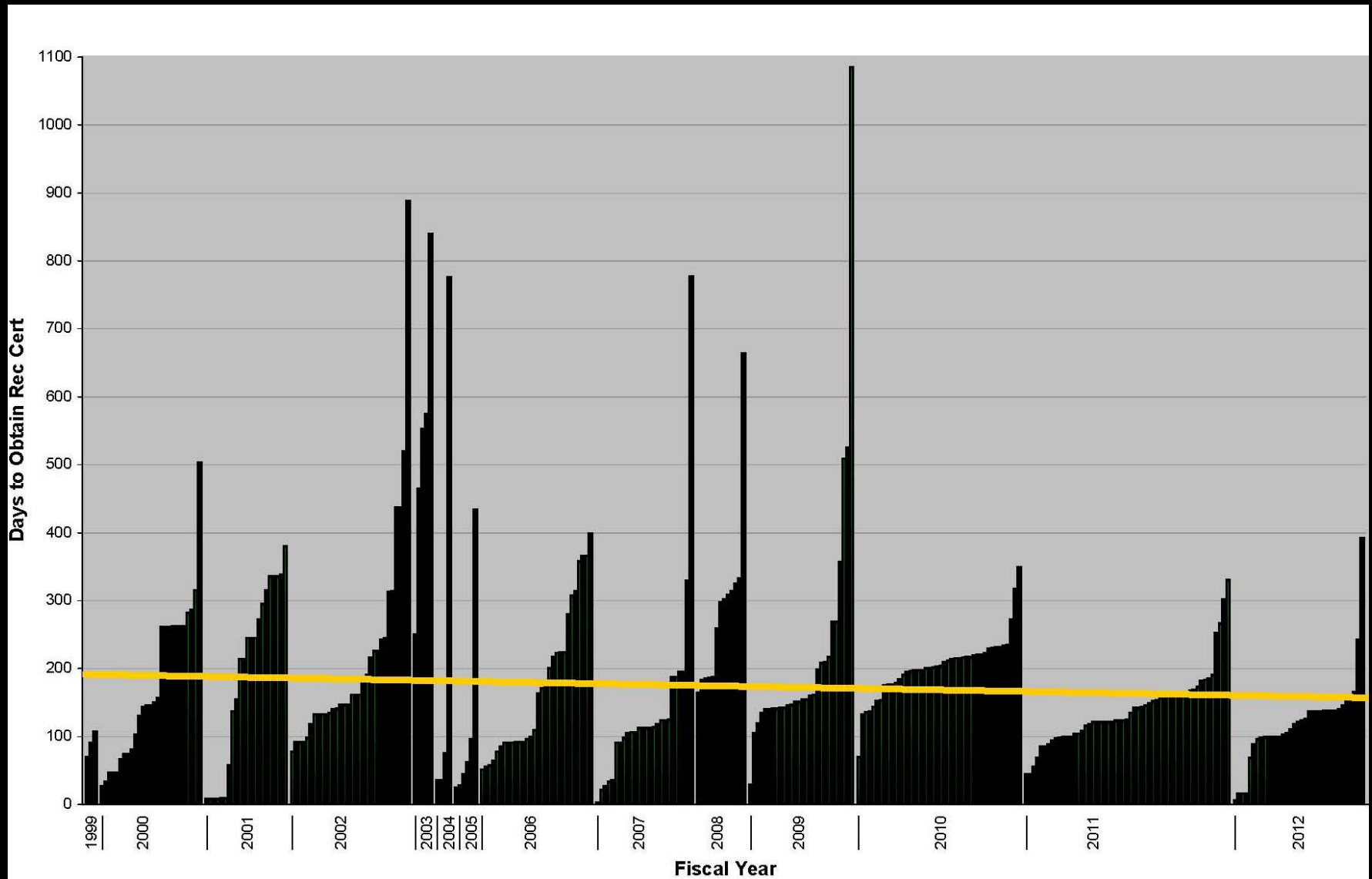
Joffre Oils Ltd.

00/14-35-014-01W5/0

**Reclamation Certificate
received July 4, 2011**

after 14 Years and \$1,302,095.19

Figure 9 Time Histogram – Days per Site to Obtain RC from ESRD



What is the explanation for trends?

1. Regulatory changes.

Regulatory changes

Year	Regulatory Change
1990	Alberta Tier 1 Criteria for Contaminated Soil Assessment and Remediation released for use as draft
1994	Reclamation criteria developed
1995	1995 update to 1994 reclamation criteria Alberta Tier 1 Criteria for Contaminated Soil Assessment and Remediation finalized
1998	Review of 1994 reclamation criteria (not implemented)
2001	Draft pipeline reclamation criteria Review of 1994 reclamation criteria (not implemented) Standardized DSA form Mandatory Phase I assessments Revised Tier I/II remediation criteria (CCME and SCARG) SCARG and Upstream Petroleum Hydrocarbon Guidelines released
2003	Change in reclamation process; dropping of site inquiry and reliance on audit process Phase II environmental site assessment requirements Guidance on use of natural recovery reclamation techniques in the native prairie and forested zones Guidance on problem species in native prairie reclamation Guidance on minimal disturbance construction techniques
2004	Assessment of drilling waste area Information Letter Barite remediation guidelines
2005	Assessment of drilling waste area guidance (significant difference to 2004 IL)

Regulatory changes

2007	Revised Phase I and reclamation certificate application forms
	Increased reclamation certificate application fee (from \$300 to \$700)
	Forested reclamation guide
	Revised Tier I/II remediation criteria
2008	Revised assessment of drilling waste area
	Change in reclamation process; routine and non-routine applications
	Professional sign off requirement
2009	Revised assessment of drilling waste area
	Record of Site Condition reporting
	Revised barite remediation guidelines
2010	Remediation certificate development
	2010 Reclamation Criteria for Wellsites and Associated Facilities
	Alberta Tier 1 Soil and Groundwater Remediation Guidelines
	Alberta Tier 2 Soil and Groundwater Remediation Guidelines
2011	Subsoil Salinity Tool, first release
	Subsoil Salinity Tool (SST) v. 2.5.2,
2012	Revised assessment of Drilling Waste Disposal Areas (ERCB Directive 050 revised)

35 Regulatory changes since 1990.

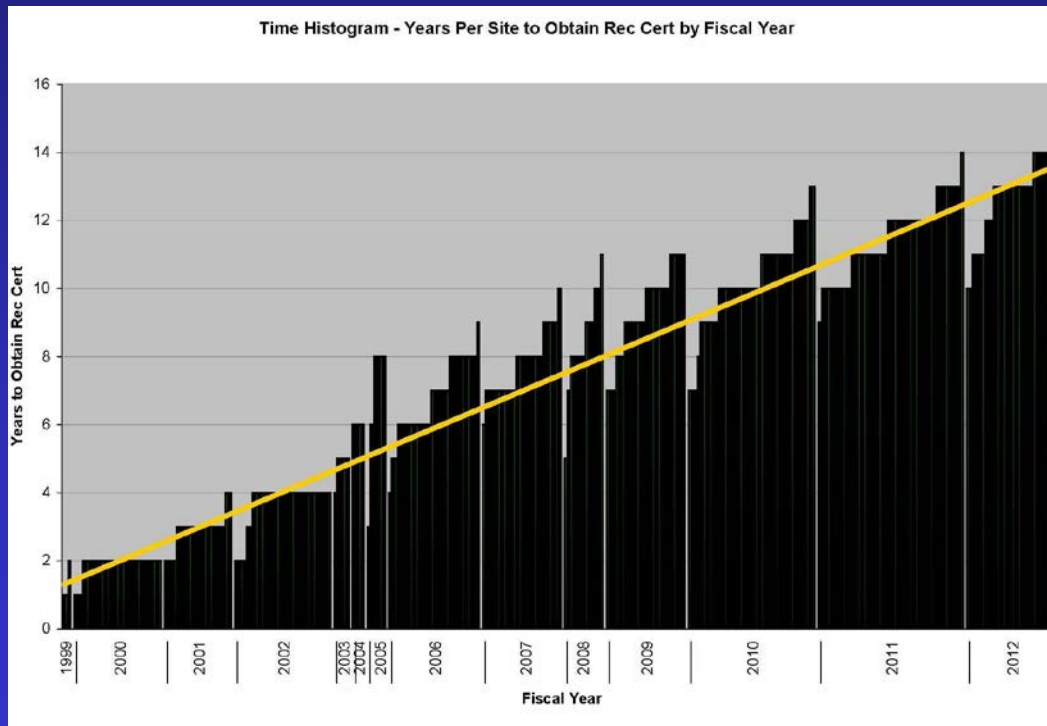
25 Regulatory changes since 2002.

What is the explanation for trends?

1. Regulatory changes.
2. Strategy of cherry picking
 - doing less expensive sites first,
 - driven by a limited budget and static inventory.
3. Increases in costs over time
 - services and equipment,
 - attention to safety.

What are our next steps?

Will these growth trends continue, as we receive new orphan sites?



New statistics

Statistics from 85 new orphan sites received in 2010 and 2011 based on actual expenditures and cost estimates.

- **Phase 1 and initial Phase 2** costs on all 85 sites (100%)
\$27,600 average out of 85
- **Phase 2 supplemental** required on 33 sites (39%)
\$18,900 average out of 85
(\$48,700 average out of 33)
- **Risk Assessment** approach required on 9 sites (11%)
\$4,800 average out of 85
(\$45,500 average out of 9)

New statistics

- **Remediation** estimates on 48 of 85 sites (56%)
because 37 sites did not require remediation
\$199,000 average of 85
(\$352,000 out of 48)
- **Reclamation** estimates on all 85 sites (100%)
\$31,100 average, ranging \$6,000 to \$118,000
- Total Phase 1 and Phase 2 investigation, risk assessment,
remediation and reclamation estimates

\$281,000 Average per Site

Closer look at Average Costs

Well sites can be broken into regulatory time periods based on when the licensee ceased to operate.

\$281,000 per site overall

- PRE Before any rules for well license transfers (prior to 1993)
\$183,000 average for 41 sites
- WSR Well Screening Ratio (1993 - 2001)
\$488,000 average for 26 sites
- LLR Liability Licensing Ratio (2001 - current)
\$207,000 average for 18 sites

Looking Forward

1. 2013-14 Budget (\$k)

• Site Reclamation	\$10,200
• Well abandonment	\$ 3,100
• Pipeline abandonment	\$ 200
• Facility abandonment	<u>\$ 200</u>
Operations Subtotal	\$13,700
• Admin, Enforcement, WIC	<u>\$ 1,350</u>
Total	\$15,050

Looking Forward

2. Growing Inventory

- New orphans from LLR changes in May 2013. 80 licensees undergoing enforcement with 1600 wells, 123 facilities, 354 pipelines.
- Seeing growth in bankruptcies and companies in receivership due to low gas prices.

Inventory as of	Mar 2013	Sep 2013	% incr
• Orphan sites	360	403	12%
• Orphan wells	74	130	76%
• Facilities	4	14	250%
• Pipelines	15	56	273%

Looking Forward

3. Performance Measures

- Growing pressure from AER to develop a Reclamation Performance Measures in terms of cost or timeliness.
- Develop statistics around timelines for remediation closure.
- How long are sites waiting on remediation?

4. Use Statistics to Support Budget Increase

- Need to develop a reclamation timeline based on public confidence and landowner dissatisfaction.

Looking Forward

5. Prepare for Growth

Orphan Well Association
needs to plan and prepare to be busier
than it has ever been in the past.



Thank You

Pat Payne, Manager
Orphan Well Association
(403) 297-8555
pat.payne@aer.ca