



ORPHANED WELLS PROGRAM ANNUAL REPORT TO CONGRESS

NOVEMBER 2023

Bipartisan Infrastructure Law Section 40601
Prepared by the Orphaned Wells Program Office

**Orphaned Wells Program Office
Policy and Environmental Management
Office of Policy, Management and Budget**

**U.S. Department of the Interior
Washington, D.C.**

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VISION STATEMENT

Transform a legacy of environmental pollution into a legacy of environmental stewardship by serving as a collaborative and empowering resource for states, Tribes, federal agencies, and the broader orphaned wells community, working to identify, plug, remediate, and restore orphaned oil and gas wells and well sites.

MISSION STATEMENT

Fulfill the orphaned wells requirements of the Bipartisan Infrastructure Law and Secretary's Order 3409 by facilitating the effective, accountable, and efficient implementation of the state, Tribal, and federal assistance programs to reduce methane emissions, prevent groundwater and surface water contamination, eliminate health and safety hazards, create good paying jobs and benefit historically disadvantaged communities.

*Cover page photo: March 2023 photo of orphaned oil and gas well outside of Houston, Texas. The orphaned well will be plugged and the site remediated and restored with Bipartisan Infrastructure Law funds.
Photo credit: Department of the Interior*

Orphaned Wells Program Annual Report to Congress Fiscal Year 2023

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List of Abbreviations and Acronyms

BIL	Bipartisan Infrastructure Law
BLM	Bureau of Land Management
BSEE	Bureau of Safety and Environmental Enforcement
CEJST	Climate and Economic Justice Screening Tool
CO2	Carbon Dioxide
Department	U.S. Department of the Interior
EJScreen	EPA’s Environmental Justice Screening and Mapping Tool
EMIS	Environmental Management Information System
EPA	U.S. Environmental Protection Agency
FTEs	Full-Time Employees
FWS	U.S. Fish and Wildlife Services
FY	Fiscal Year
g/hr	Gram Per Hour
GDP	Gross Domestic Product
IDIQ	Indefinite Delivery Indefinite Quantity
IIJA	Infrastructure Investment and Jobs Act
IOGCC	Interstate Oil and Gas Compact Commission
LDNR	Louisiana Department of Natural Resources
LSU	Louisiana State University
NAS	National Academy of Sciences
NPS	National Park Service
OWPO	Orphaned Wells Program Office
RBDMS	Risk-Based Data Management Solutions
RFI	Request for Information
SO	Secretary's Order
Template	Orphaned Well Data Reporting Template
USFS	Department of Agriculture U.S. Forest Service
USGS	U.S. Geological Survey

Orphaned Wells Program Annual Report to Congress Fiscal Year 2023

Message from the Director

The U.S. Department of the Interior Orphaned Wells Program Office is proud to submit the Annual Report to Congress, as required in Section 40601(f) of the Infrastructure Investment and Jobs Act, commonly known as the Bipartisan Infrastructure Law.

This report highlights the Bipartisan Infrastructure Law funds distributed to state, Tribal, and federal program participants and work completed during the fiscal year to inventory and plug orphaned wells under the newly established Orphaned Wells Program Office.



Bipartisan Infrastructure Law funds have accelerated well plugging and habitat restoration under federal, state, and Tribal programs, resulting in methane mitigation and prevention of groundwater and surface water contamination, creation of good-paying jobs, and revitalization of economically-disadvantaged communities. The Department of the Interior has committed to a bold implementation framework and continues to build momentum from the previous year to engage with the orphaned wells community to transform a legacy of environmental pollution into a legacy of environmental stewardship, one plugged well at a time.

Recent data collected from program participants and efforts to strengthen undocumented, idled, and orphaned well inventories have further demonstrated the extent of legacy pollution across the country and the importance of addressing the problems posed by orphaned wells. The mission of the Orphaned Wells Program Office is more relevant and urgent than ever. Efforts to address this legacy pollution are detailed in this report, along with the blueprint for future years' work to continue reducing the impacts of orphaned wells.

A handwritten signature in black ink that reads "Kimbra Davis". The signature is written in a cursive, flowing style.

Kimbra Davis
Director, Orphaned Wells Program Office
U.S. Department of the Interior

Orphaned Wells Program FY 2023 At-a-Glance

\$64.5M

Distributed for Federal Well Plugging, Remediation and Restoration

\$39.4M

Awarded for Tribal Implementation and Development Grants for Orphaned Well Activities

113 wells

Plugged and Abandoned on Federal Land

***5,981 wells**

Plugged and Abandoned on State and Private Lands

****11,804 metric tons**

Estimated Methane Emissions Reduction (Expressed as a Carbon Dioxide Equivalent)

****185 habitat acres**

Restored on State and Private Lands Under Initial Grants

** The total count of wells 5,981 wells plugged on state and private lands uses states' Initial Grants reporting as of September 30, 2023.*

***The estimated methane emissions reduction and habitat acres data use states' Initial Grants reporting as of June 30, 2023.*

Section 1: Orphaned Wells Program

Background

The Infrastructure Investment and Jobs Act (Public Law 117-58), signed into law on November 15, 2021, and commonly known as the Bipartisan Infrastructure Law (BIL), is a historic investment in our Nation's infrastructure. Section 40601, "*Orphaned Well Site Plugging, Remediation, and Restoration*," in Title VI, "*Methane Reduction Infrastructure*," confronts the potent atmospheric pollution that orphaned oil and gas wells emit, while also accounting for the legacy impact that orphaned wells have on their surrounding environment. Orphaned wells on federal land are defined as wells that are not used for an authorized purpose and for which no operator can be located or the operator of which is unable to plug the well and remediate and reclaim the well site.¹ States may have a different meaning and definition for orphaned wells on state and private lands.

Figure 1: Orphaned well on federal land in California managed by the Bureau of Land Management.



By and through Section 40601, Congress established the Orphaned Wells Program to address legacy pollution, including methane emissions and water contamination, and to identify and address any disproportionate burden of adverse human health or environmental effects of orphaned wells on communities of color, low-income communities, and Tribal and indigenous communities. To achieve this, Section 40601 directs the Secretary of the Interior to establish programs to inventory and properly plug orphaned wells on federal, state, Tribal, and private lands. On January 10, 2023, Secretary of the Interior Deb Haaland issued Secretary's Order 3409 Establishment of the Orphaned Wells Program Office, creating the Orphaned Wells Program Office (OWPO) under the Office of the Assistant Secretary - Policy, Management and Budget. The OWPO is tasked by the Secretary with implementing the overwhelming majority of the Orphaned Wells

Program established in Section 40601. This report describes program accomplishments in fiscal year (FY) 2023 and addresses the specific reporting metrics required in the Bipartisan Infrastructure Law. These Bipartisan Infrastructure Law reporting metrics are detailed in Sections 2 through 5 of this report.

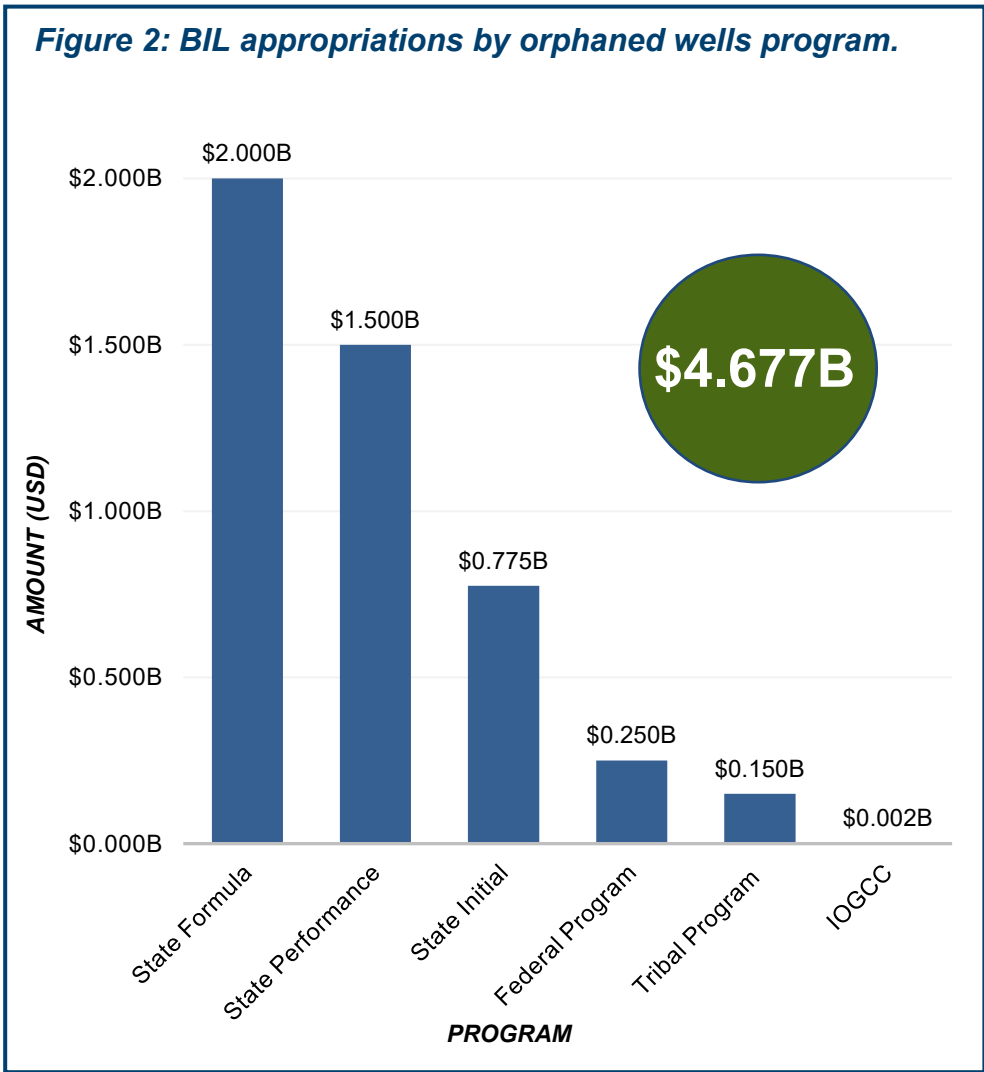
Figure 2 summarizes the \$4.677 billion of appropriated BIL funds allocated by program. Of this \$4.677 billion in funds provided, the U.S. Department of the Interior (Department) established the following programs:

- Federal Program - \$250 million for wells on federal land and waters;
- State Program - \$4.275 billion for wells on state and private lands; and
- Tribal Program - \$150 million for wells on Tribal lands.

¹ Orphaned Wells Program Office: [Definition List](#).

In addition to the \$4.675 million in program funding listed above, \$2 million in appropriated BIL funds is authorized for the Interstate Oil and Gas Compact Commission (IOGCC) to carry out responsibilities outlined in Section 40601.

Funding under these statutory programs may be used by federal, state, and Tribal participants to identify and prioritize wells, measure air emissions and groundwater contamination leaking from wells, identify and address disproportionate burdens to underserved communities, remediate, and reclaim orphaned wells, remediate contaminated soil, and restore native species and adjacent land. The **Distribution of FY 2023 Bipartisan Infrastructure Law Funds** subsection beginning on Page 6 of this report, details the funds distributed to date under the Federal, State, and Tribal programs.



Wells plugged to date using BIL funds are included under the subsection for each program.

Analysis conducted by the Environmental Defense Fund estimates that 14 million people in the United States live within one mile of an orphaned well.² **Figure 3** is an example of how these orphaned oil and gas wells can be located adjacent to occupied residences, posing a direct threat to human health and the environment from deteriorating infrastructure, methane and other gaseous emissions, and oil and gas leaks.

The Orphaned Wells Program advances the goals of the Biden-Harris Administration’s Methane Action Plan by reducing active methane leaks from orphaned oil and gas wells. **Section 2: Inventories of Orphaned Wells** discusses inventories of orphaned wells and wells at risk of becoming orphaned. **Section 3: Methane Emissions** addresses programmatic methane emission reduction goals, with **Section 4: Economic Opportunities** and **Section 5:**

² Environmental Defense Fund (07/11/2023): [Landmark study reveals that millions of Americans live less than a mile from an orphaned oil and gas well.](#)

Habitat Restoration discussing the economic opportunities from orphaned wells plugging and resulting habitat restoration, respectively.

Figure 3: Orphaned gas well on residential property in Ohio.



Photo Description: Picture shows a vent installed in a residential backyard prior to plugging. Photo taken during an OWPO site visit.

Further, the Orphaned Wells Program is part of the Administration’s Justice40 Initiative to advance environmental justice.³ The Justice40 Initiative makes it a goal to ensure that 40 percent of the overall benefits of certain federal investments reach communities overburdened by pollution and historical underinvestment. **Section 6: Accomplishments and Future Outlook** discusses the benefits to communities with environmental justice concerns from orphaned well plugging and remediation, along with an outlook into FY 2024 and FY 2025 anticipated Orphaned Well Program activities.

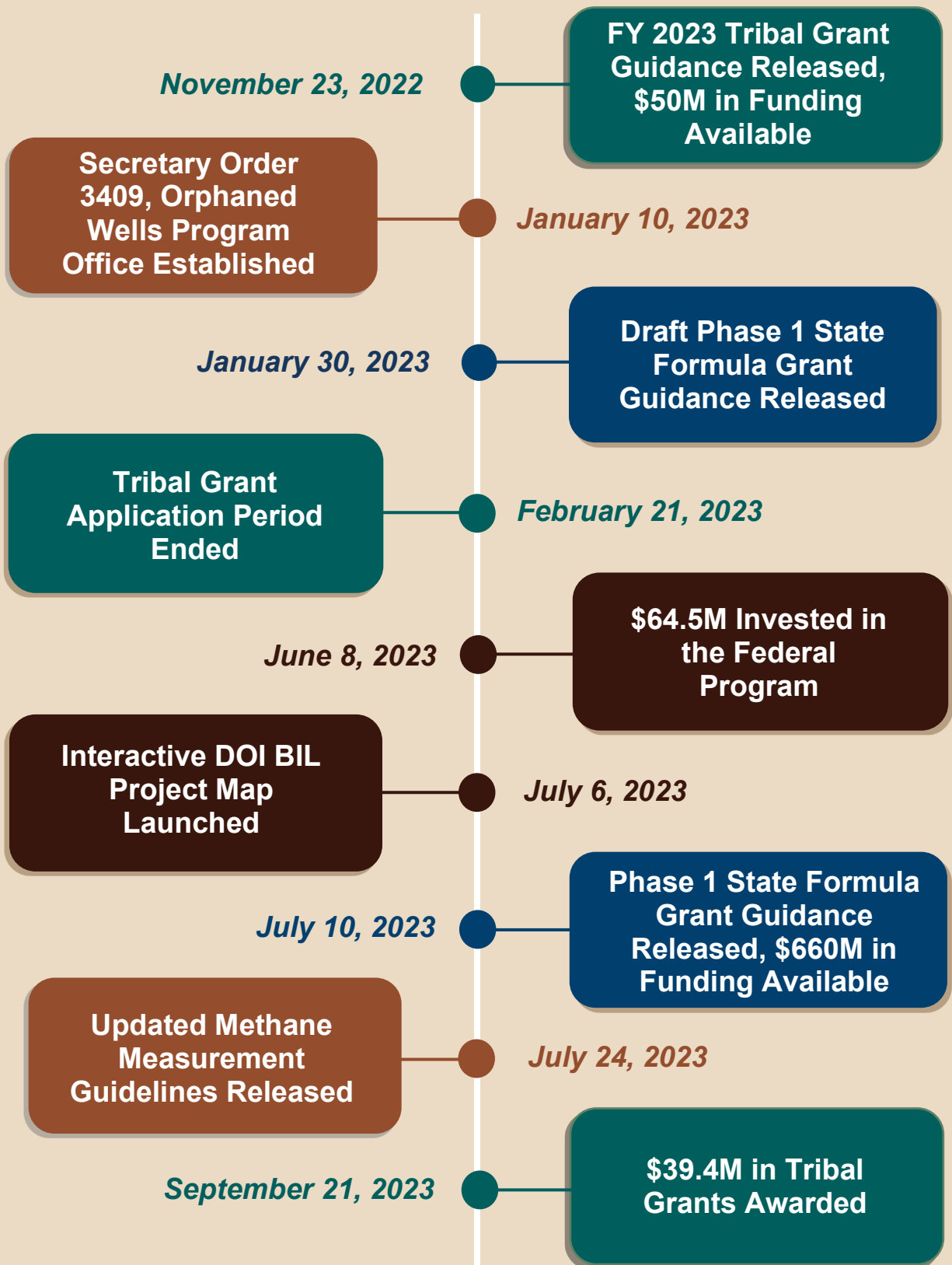
Establishment of the Orphaned Wells Program Office

In January 2023, the Secretary of the Interior established the OWPO to implement and manage the financial assistance programs and programmatic activities required under Section 40601 of the Bipartisan Infrastructure Law.

Establishing the OWPO ensures the effective, accountable, and efficient implementation of the state and Tribal financial assistance programs, including the coordination mandated with states, the Secretary of Energy, and the Interstate Oil and Gas Compact Commission (IOGCC) to implement the program. Summarily, the OWPO is responsible for all program and administrative responsibilities Congress has delegated to the Secretary of the Interior under Section 40601 of the Bipartisan Infrastructure Law. The **FY 2023 Orphaned Wells Program Milestones** graphic on the following page reflects the OWPO creation and key program activities.

³ White House: [Justice40 Initiative](#).

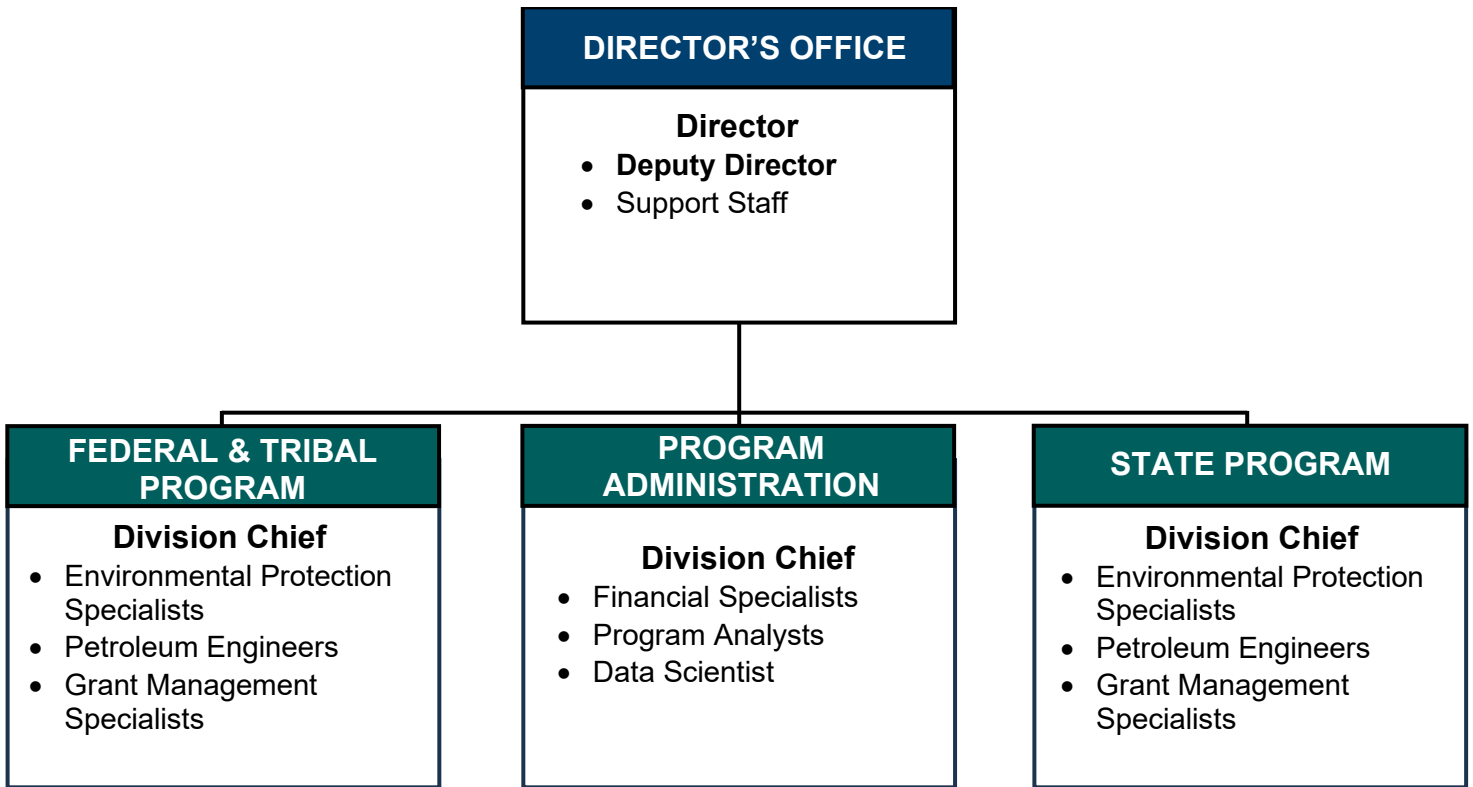
FY 2023 Orphaned Wells Program Milestones



● Federal ● State ● Tribal ● OWPO

The OWPO is organizationally structured within the Department’s Policy and Environmental Management Division under the Office of Policy, Management and Budget. Under the leadership of the Director, the OWPO management and staff are responsible for oversight and administration of the State Program and the Federal and Tribal Programs, with support provided by the Program Administration division. The current OWPO organizational structure is shown in the chart in **Figure 4**. As of September 30, 2023, the OWPO is staffed with 16 full-time employees (FTEs) and when fully staffed, the program will total approximately 30 FTEs.

Figure 4: Organizational structure of the Orphaned Wells Program Office.



Distribution of FY 2023 Bipartisan Infrastructure Law Funds

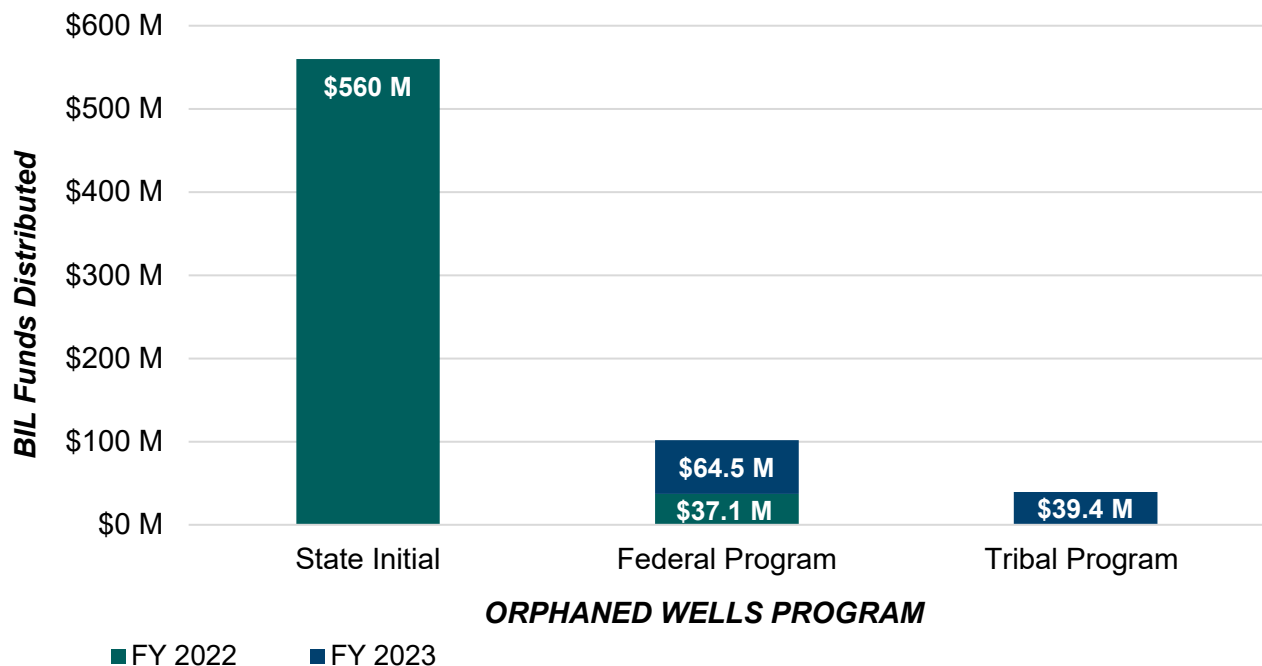
In FY 2023, the Department distributed \$103.9 million in BIL funds to federal and Tribal program participants for inventorying and plugging orphaned wells, including remediation and restoration work. This brings the cumulative total of BIL funds distributed to date to \$701 million of the \$4.677 billion appropriated for the Orphaned Wells Program. As illustrated in **Table 1**, to date, 15 percent of the \$4.677 billion in BIL funds has been distributed under the state, federal, and Tribal programs. **Figure 5** illustrates the funds distributed to date, for each fiscal year, by program area.

\$103.9 million was distributed in FY 2023 for orphaned well plugging, remediation, and reclamation.

Table 1: BIL funds distributed through FY 2023.

Bipartisan Infrastructure Program	Total BIL Funds Enacted Amount Available for FY 2022 through FY 2030	Total BIL Program Amount as a Percentage of Total Enacted Amount	BIL Program Amount Distributed through September 2023	BIL Program Amount Distributed through September 2023 as a Percentage of Total Enacted Amount
Federal Program	\$250 M	5.35 %	\$102 M	2.2 %
State Program	\$4.275 B	91.40 %	\$560 M	12.0 %
Tribal Grants	\$150 M	3.21 %	\$39 M	0.8 %
IOGCC	\$2 M	0.04 %	N/A	N/A
TOTAL	\$4.677 B	100 %	\$701 M	15 %

Figure 5: Cumulative BIL funds distributed by program through FY 2023.



Federal Program

Distributions for Federal Activities

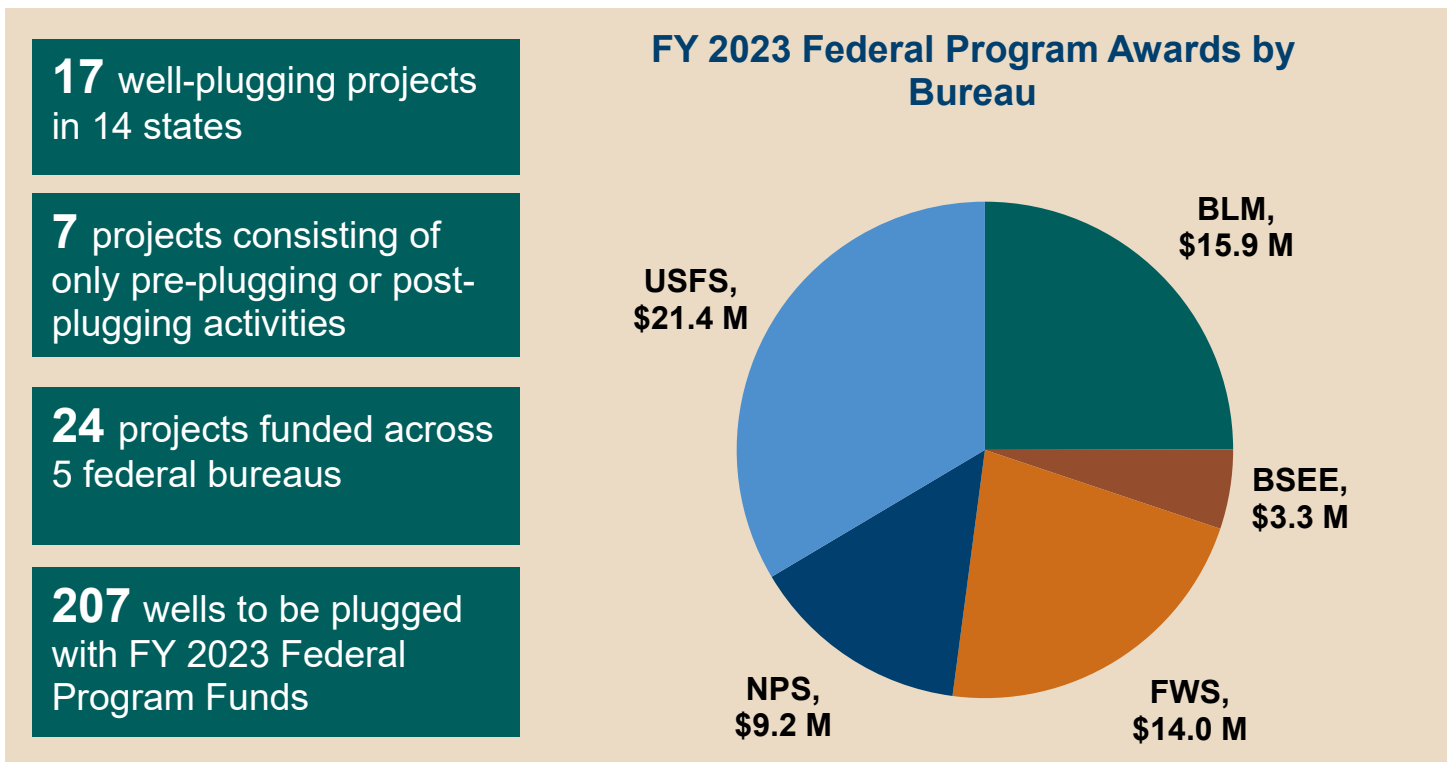
In FY 2023, \$64.5 million was distributed under the Federal Program to fund oil and gas well plugging, remediation, and restoration projects for the following Department of the Interior and Department of Agriculture land management bureaus:

- Bureau of Land Management (BLM),
- Bureau of Safety and Environmental Enforcement (BSEE),
- U.S. Fish and Wildlife Service (FWS),
- National Park Service (NPS) and,
- U.S. Department of Agriculture Forest Service (USFS).

\$101.6 million
has been distributed to date for Federal Orphaned Wells inventory, plugging, and remediation.

This \$64.5 million provided funding to plug and remediate 207 orphaned wells across a total of 24 well-site projects located in national parks, national forests, national wildlife refuges, and on other federal land and waters. Of the 24 well-site projects approved for funding, seven well-site projects consist of only pre-plugging activities (e.g., access, diagnostics, and inventory) and post-plugging activities (e.g., reclamation, remediation, equipment removal, and inventory). **Figure 6** provides an overview of the funding distributed in FY 2023 under the Federal Program.⁴ All FY 2023 accomplishments reported under this section for the Federal Program are as of September 30, 2023.

Figure 6: FY 2023 distribution of BIL funds to federal partners.

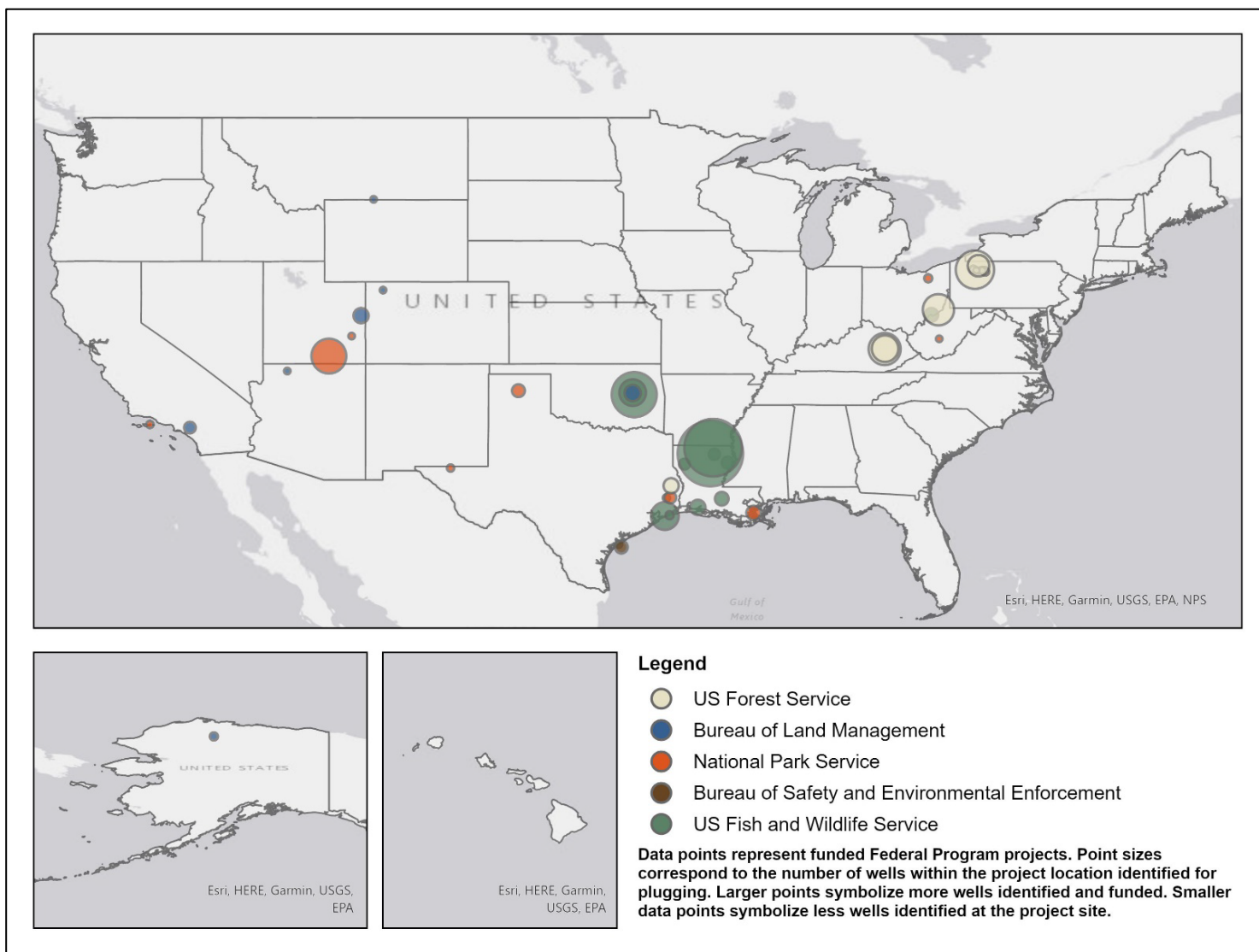


⁴ The bureau awards shown in Figure 6 do not include \$695,000 disbursed in FY 2023 for funding to supplement FY 2022 project funding.

A total of \$101.6 million in funding, approximately 40.7 percent of the \$250 million appropriated for the Federal Program, has been distributed in fiscal years 2022 and 2023 for plugging, remediation, and restoration activities on federal land. **Figure 7** depicts the geographical location of the total 486 Federal Program wells funded, to date, for plugging, remediation, and restoration.⁵ Of the 277 orphaned wells approved for plugging with FY 2022 Federal Program funds, 113 wells have been plugged as of September 30, 2023, depicted in **Figure 8**. **Figure 9** shows the location of the 207 wells approved for plugging with FY 2023 Federal Program funds.

113 orphaned wells have been plugged to date on federal land under the Federal Program.

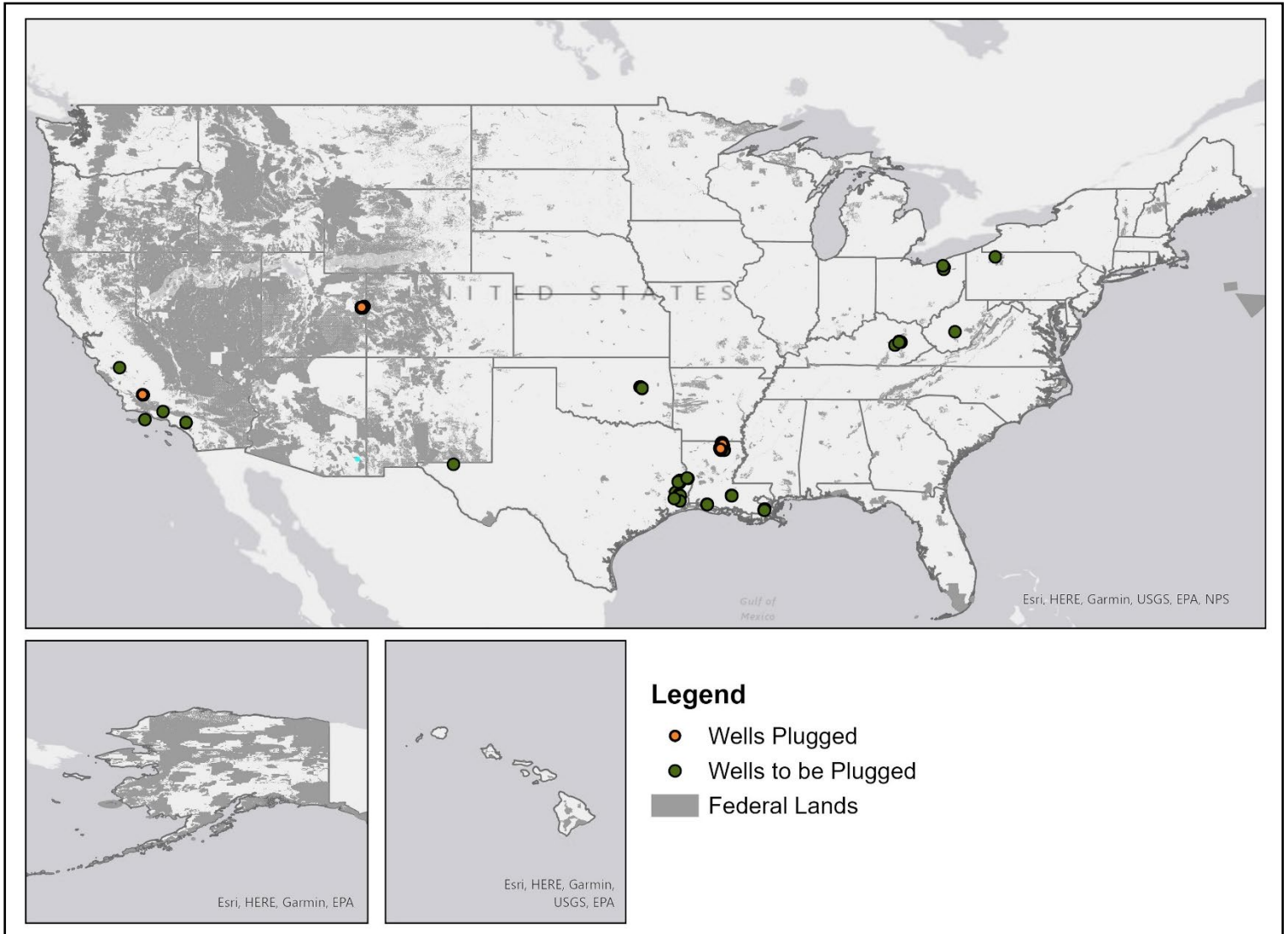
Figure 7: Federal program projects funded in FY 2022 and FY 2023, by bureau.



Description of map (Figure 7): Shows the location of total 486 Federal Program wells funded, to date, for plugging, remediation, and restoration, by bureau.

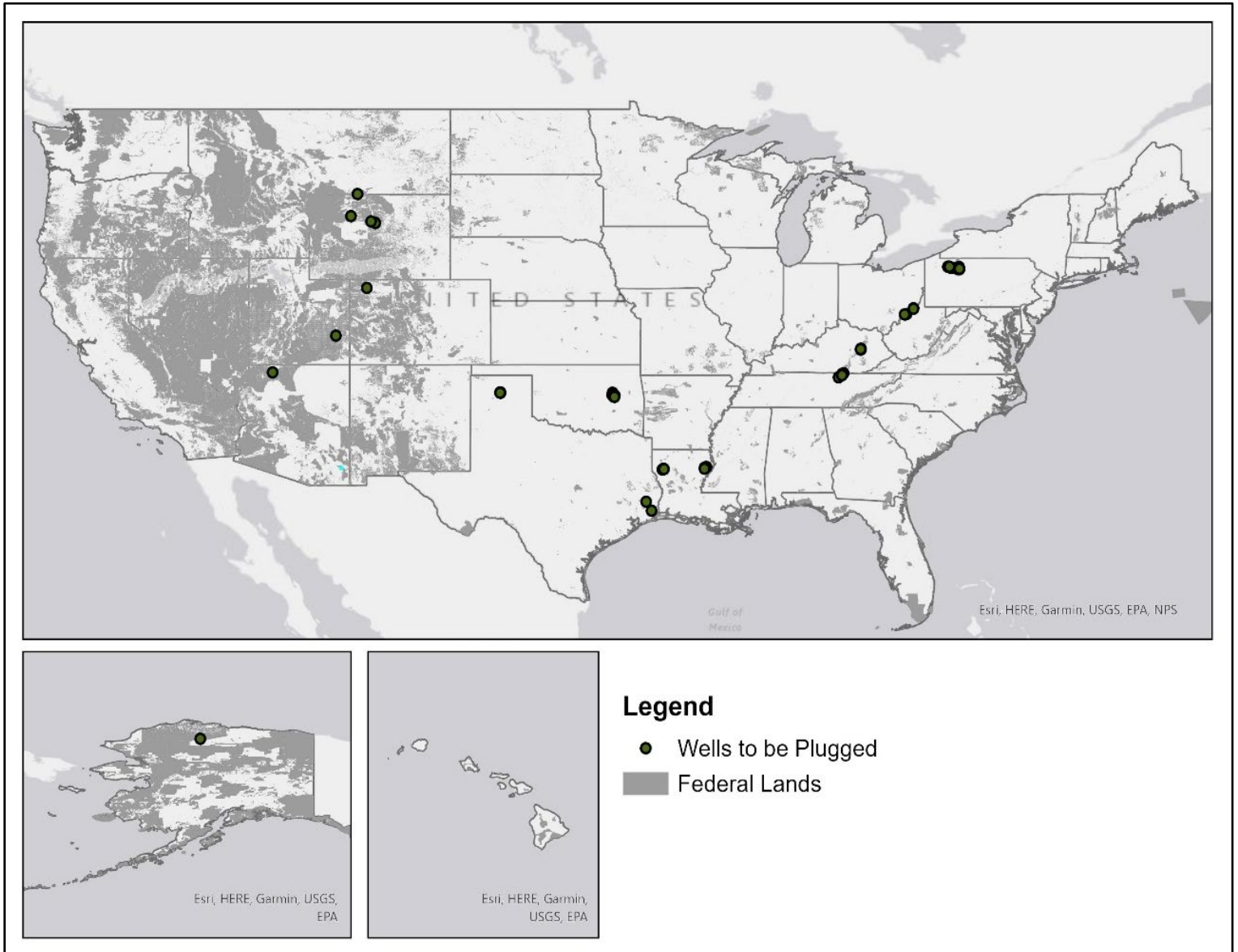
⁵ The count of 486 federal wells to be plugged for FY 2022 and FY 2023 is an estimated count through September 2023. The number of wells to be plugged may be adjusted over time due to changes in costs and other variables.

Figure 8: Map of the FY 2022 federal orphaned wells.



Description of map (Figure 8): Shows the location of 113 orphaned wells plugged and remaining 164 to be plugged on federal land from the total 277 wells the Department prioritized and approved for funding in FY 2022.

Figure 9: Map of FY 2023 federal orphaned wells to be plugged.



Description of map (Figure 9): Shows the location of 207 orphaned wells to be plugged on federal land prioritized and approved for funding in FY 2023.

Prioritization of Federal Program Activities

The federal orphaned well projects approved for inventorying, plugging, remediation, and/or restoration in FY 2023 were prioritized and funded in consideration of the following:

- Impacts to public health and safety; ongoing and potential environmental harm.
- Emissions of methane and other harmful air pollutants; potential for increased risk due to climate change.
- Proximity to environmental justice communities.
- Other subsurface impacts or land use priorities, including consideration of state or Tribal plans or priorities for orphaned wells on state, private, or Tribal lands.

Further, high-priority and moderate-priority sites in the same proximity (e.g., within the same national wildlife refuge or national park unit) were grouped in the same project for plugging approval and BIL funding. This prioritization approach increases efficiency and cost effectiveness while preventing further deterioration of the sites. It ensures funds from the Bipartisan Infrastructure Law will have the largest possible impact to clean up legacy hazards and protect public waters and lands while addressing the health and safety of local communities.

Execution of Federal Program Activities

Federal land managers provided narratives with their project proposals describing the readiness of each site, with a majority indicating plugging operations would occur in 2024 or later based on June 2023 distributions and the timing of contracting processes. For example, in early August 2023, BSEE awarded two five-year contracts for the decommissioning of nine orphaned wells in the Matagorda Island area offshore Texas. Estimated plugging timelines also vary by project site based on weather limitations (e.g., icy roads for locations in Alaska), availability of oil and gas staff resources by state, and other factors. Other sites, such as Red River National Wildlife Refuge in Louisiana, were noted as “shovel-ready,” meaning there were existing roads and no private land access issues, with plugging estimated to be completed as early as April 2024.

In May 2023, the BLM awarded 13 Indefinite Delivery Indefinite Quantity (IDIQ) contracts to remediate orphaned wells on federal and Tribal lands.⁶ These IDIQ contracts will expand capacity for participating federal partners and Tribal land managers to leverage funding provided under the Federal and Tribal Programs for well remediation activities. All contracts were awarded to small businesses, with two of four regional contracts reserved for Indian Small Business Economic Enterprise entities under the Buy Indian Act. These contracts create efficient and centralized options for the Department, USFS, and Tribal land managers to work with small businesses and Indian Small Business Economic Enterprises on well plugging and remediations operations.

Figure 10: Gauley River National Recreation Area, BIL funded orphaned well site post plugging.



Consultation and Coordination under the Federal Program

Consistent with the multi-agency Memorandum of Understanding signed on January 14, 2022, the OWPO continued to work cooperatively with the Energy Community Revitalization Program

⁶ Bureau of Land Management (05/08/2023): [BLM Awards Contracts to Remediate Orphan Wells on Public and Tribal Lands Press Release](#).

Technical Working Group, the Executive Group, and the IOGCC under the Federal Program. **Section 6: Accomplishments and Future Outlook** provides more detail on the Department's consultation with the IOGCC throughout FY 2023.

Figure 11: Work underway to plug an orphaned well in Southeast Michigan.



Figure 12: Work underway to plug an orphaned well in Northern Michigan.



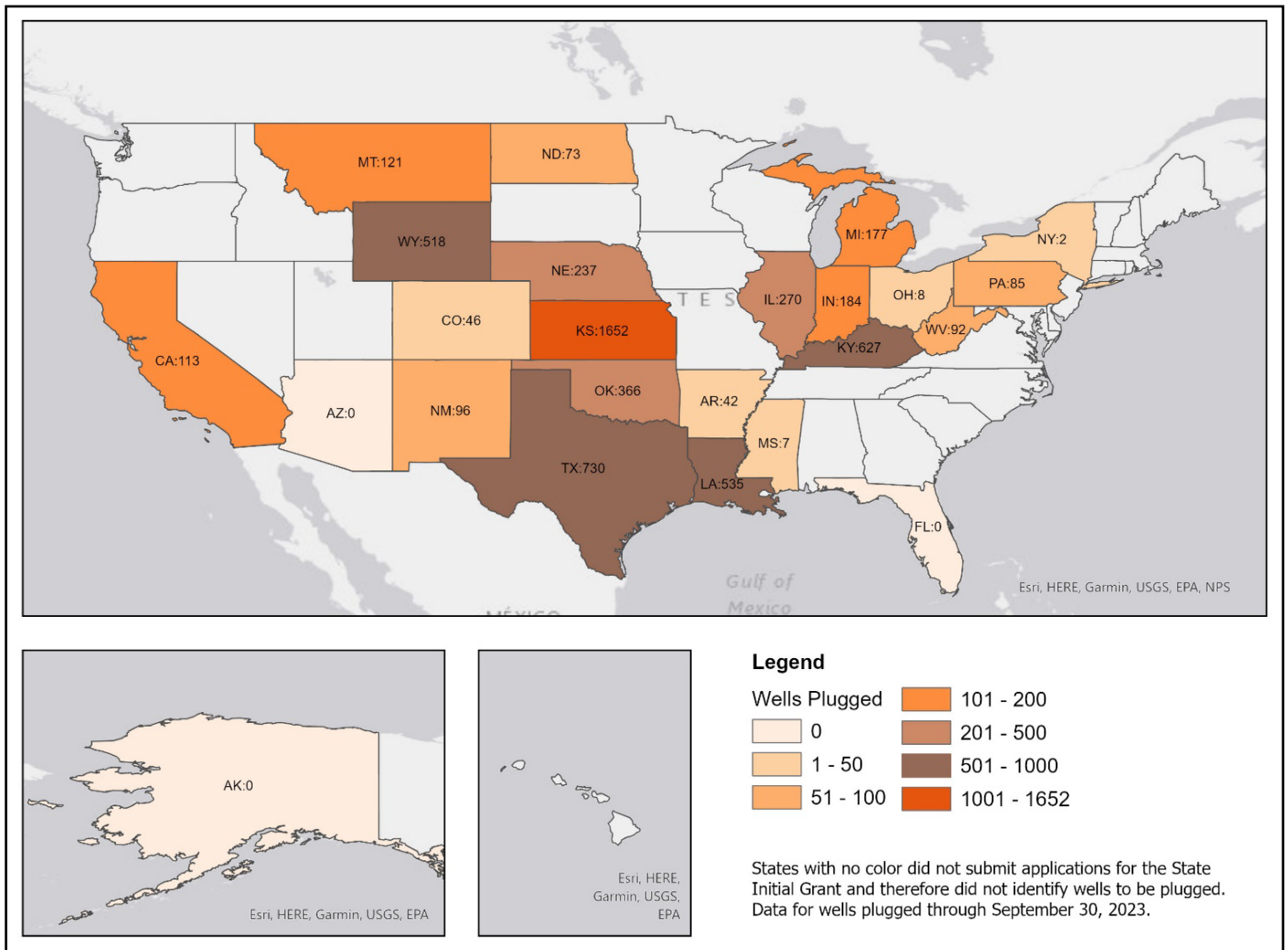
State Program

Progress of State Initial Grants

In FY 2022, the Department distributed \$560 million in State Initial grants to state orphaned well plugging programs in twenty-four states. Twenty-two states received \$25 million large-scale Initial grants and two states received \$5 million small-scale Initial grants. The Initial grants bolster certain states' longstanding well plugging programs and build capacity for states to expand or begin well plugging activities. Based on data provided in the grant applications, the \$560 million distributed in Initial grant funds is expected to plug and reclaim nearly 10,000 high-priority wells on state and private lands. For states that did not receive Initial grants in FY 2022, funding remains available for \$5 million small-scale Initial grants. Additional states have submitted applications for small-scale Initial grants in FY 2023, which are currently being reviewed, with awards anticipated in FY 2024.

5,981 wells
plugged as of
September 30, 2023,
on state and private
lands using State
Initial grant funding.

Figure 13: State and private wells plugged under the Initial Grants Program, as of September 30, 2023.



State quarterly performance reports submitted in October 2023 detail that 5,981 wells have been plugged as of September 30, 2023.⁷ **Figure 13** identifies the number of wells plugged by state as of September 30, 2023, using State Initial grant funding. Initial grant recipients are required to submit quarterly reports to the Department, which document states' progress with orphaned wells activities using BIL funds during the previous quarter. These quarterly reports provide the Department with information on states' inventory of orphaned wells, the number of wells plugged, number of jobs created or saved, acres of habitat restored, and other performance measures.

The data reported by states on methane emissions are included in **Section 3: Methane Emissions**. To date, seven states have reported a total of 185 habitat acres restored following the plugging of 867 wells. **Section 5: Habitat Restoration** provides additional details on the states' habitat restoration achievements. States are required to submit their Initial grant 15-month report by the end of 2023.

Data for habitat restored and methane emission reduction by states for FY 2023 discussed in this report are as of June 30, 2023, as fourth quarter reports from the states were not available in time to meet the Department's deadline to submit this Report to Congress by November 15, 2023.

Figure 14: Before (left) and after (right) photos of a West Virginia well site pre- and post-plugging.



Description of photos: Before photo: During a site visit in March 2023, Department leadership observed petroleum leaking from the well requiring soil remediation and surface water sampling of a nearby ditch during plugging efforts. **After photo:** The OWPO staff obtained this photo in August 2023, showing a well marker demonstrating that the well has been plugged.

⁷ The estimated count of wells plugged as of September 2023 includes 5,981 wells as tabulated from state's fourth quarter performance reports. This data is self-reported by states and subject to OWPO verification.

Implementation of Formula Grants

On July 10, 2023, the Department issued the Phase 1 State Formula Grant Guidance⁸ (guidance) and announced the availability of \$658 million to 26 states for orphaned well plugging, remediation and reclamation.⁹ The guidance sets forth the application process for states to receive Phase 1 Formula grants and provides requirements for carrying out activities under the State Formula grants authorized in the Bipartisan Infrastructure Law. The Formula grant investments will bolster states' well plugging programs and provide significant financial

Table 2: State Program – Total and Phase 1 Formula Grant eligibility by state.

State	Total Eligibility	Phase 1 Eligibility
Alabama	\$1,681,430	\$1,681,430
Alaska	\$28,336,497	\$25,000,000
Arizona	\$4,871,791	\$4,871,791
Arkansas	\$5,589,721	\$5,589,721
California	\$140,870,510	\$35,217,628
Colorado	\$54,064,506	\$25,000,000
Illinois	\$36,875,485	\$25,000,000
Indiana	\$14,076,668	\$14,076,668
Kansas	\$33,666,697	\$25,000,000
Kentucky	\$78,980,737	\$25,000,000
Louisiana	\$86,449,520	\$25,000,000
Michigan	\$5,873,295	\$5,873,295
Mississippi	\$6,830,345	\$6,830,345
Missouri	\$26,925,384	\$25,000,000
Montana	\$5,139,423	\$5,139,423
Nebraska	\$4,151,076	\$4,151,076
New Mexico	\$72,260,163	\$25,000,000
New York	\$44,672,162	\$25,000,000
North Dakota	\$55,266,234	\$25,000,000
Ohio	\$231,028,206	\$57,757,052
Oklahoma	\$205,226,972	\$51,306,743
Pennsylvania	\$305,625,896	\$76,406,474
Texas	\$318,695,029	\$79,673,757
Utah	\$5,229,389	\$5,229,389
West Virginia	\$116,932,226	\$29,233,057
Wyoming	\$40,680,639	\$25,000,000
TOTAL	\$1,930,000,000	\$658,037,849

resources over several years to plug, remediate, and reclaim thousands of orphaned wells on state and private lands.

In Phase 1, states may apply for a grant of up to \$25 million or up to 25 percent of the state's total formula eligibility, whichever is greater, without exceeding the state's total formula eligibility. **Table 2** provides Phase 1 eligibility by state.

States eligible to receive more than \$25 million in total funds may submit additional Formula grant applications in future phases until the State has been awarded the entire amount it is eligible to receive. A state that receives a Formula grant has five years from the date of receipt of the funds to obligate the funds for authorized activities and purposes.

The funding available in Phase 1 represents 34 percent of the \$1.93 billion in total Formula grant eligibility. States are eligible for Formula grants based on a formula established by the Secretary, which is based on:

⁸ Orphaned Wells Program Office (07/10/2023): [Phase 1 State Formula Grant Guidance](#).

⁹ Department of the Interior (7/10/2023): [Biden-Harris Administration Invests \\$660 Million for States to Plug Orphaned Oil and Gas Wells](#).

- Job losses in the state for the oil and gas industry between March 1, 2020, and November 15, 2021;
- The number of documented orphaned wells located in the state; and
- The projected costs to plug and/or reclaim those orphaned wells, including costs for reclamation of adjacent land and to decommission or remove associated pipelines, facilities, and infrastructure.

The 26 states that are eligible for a Phase 1 Formula grant have until December 31, 2023, to submit their applications. This funding is expected to be disbursed in FY 2024.

On August 15, 2023, the OWPO, in partnership with the Interior Business Center and in coordination with IOGCC, conducted a webinar on the Formula grants to provide states with technical assistance and answers to questions.

Planning and Designing for Performance Grants

Performance grants are the third category of grants, with \$1.5 billion available. There are two categories of Performance grants: Matching grants and Regulatory Improvement grants. The Department intends to bifurcate Matching and Regulatory Improvement grants, with separate guidance documents, application requirements, and application periods because of the fundamental differences in timing and design between these two grant programs. Matching grants are intended to encourage state orphaned well spending above 2010-2019 spending levels, while Regulatory Improvement grants are intended to incentivize states to enact laws or regulations that will reduce future orphaned well burdens and improve plugging standards and procedures, or reward states that have recently done so.

The Department's planning of the Matching and Regulatory Improvement grant guidance and award procedures is underway. In October 2023, the OWPO issued a Request for Information (RFI) in the Federal Register to help inform the Office's development of the Regulatory Improvement Grant Program and guidance.¹⁰ This provides an opportunity for states, stakeholders, and the public to submit comments for a period of 60 days. The OWPO will incorporate feedback received in response to the RFI into the development of the Regulatory Improvement grant guidance.

Figure 15: Aerial photo of a crew working on plugging an orphaned well in Louisiana with BIL funds (photo by the contractor, Dynamic) – April 2023 in Union Parish, Louisiana.



¹⁰ U.S. Government Publishing Office, 88 Federal Register 72528 (10/20/2023): [Request for Information to Inform the Orphaned Wells Program Office's Development of Regulatory Improvement Grants Under the Bipartisan Infrastructure Law](#).

On September 25, 2023, the OWPO finalized a contract with the National Academy of Sciences (NAS) for NAS to carry out a series of tasks and provide the Department with research support and technical expertise related to well plugging policies, practices, standards, and procedures.¹¹ This contract is to advance all ongoing BIL-funded orphaned well plugging activities, with a focus on the development and administration of the Regulatory Improvement grants. NAS will commission white papers offering a comparative analysis of well plugging standards, procedures, and methods; convene a workshop to discuss well plugging practices; and publish a proceeding documenting the discussions and outcomes of the workshop. As a part of this contract, the OWPO may request NAS engage an ad hoc committee of subject matter experts and produce a consensus study report that provides advice to the Department on current and emerging technologies, best practices, gaps in technology, and research related to well-plugging.

Tribal Program

The Bipartisan Infrastructure Law provides \$150 million for well plugging, remediation, and reclamation on Tribal land. Tribes may use this available amount for the following eligible activities:

- Plug, remediate, or reclaim orphaned wells on Tribal land;
- Restore soil and habitat in the degraded area and decommission or remove associated infrastructure;
- Identify and characterize additional undocumented wells on Tribal land; and
- Set up well-plugging capacity where not already established.

*In FY 2023,
\$39.4 million
was awarded for
Tribal well
plugging,
remediation, and
reclamation.*

The \$150 million will be distributed over multiple funding opportunities, with an initial \$50 million made available in FY 2023. This initial funding opportunity and Final Tribal grant guidance was published on November 23, 2022.¹² Two types of grant funding were made available:

- Tribal Implementation grants: to plug, remediate, and reclaim orphaned well sites on an Indian Tribe's trust or restricted lands.
- Program Development grants: to assist Tribes in the development or administration of a Tribal Program to carry out any activities associated with plugging, remediating, and/or reclaiming orphaned well sites on an Indian Tribe's trust or restricted lands.

A third option available under the Tribal Program is "in lieu of grant" funding. This option allows a Tribe to request that the Department administer and carry out plugging, remediation, and reclamation activities on the Tribe's behalf, consistent with the Department's trust responsibilities. The Tribal grant awards address the disproportionate burden of environmental pollution in indigenous communities while supporting sustainable development and good-paying jobs.

¹¹ National Academy of Sciences: [Practices and Standards for Plugging Orphaned and Abandoned Hydrocarbon Wells: A Workshop](#).

¹² Orphaned Wells Program Office (11/23/2022): [Fiscal Year 2023 Final Tribal Grant Guidance](#).

Of the up to \$50 million made available, a total of \$39.4 million in Implementation and Development grants were distributed to Tribes in September 2023 for plugging of up to 414 wells and implementation of Tribes' well plugging activities (**Table 3**). Of the \$10.6 million remaining from the initial \$50 million made available in FY 2023, \$5 million is set aside for "in lieu of grant" funding and the remaining amount will be made available in future Tribal grant funding opportunities.

Table 3: FY 2023 Tribal grant awards for wells to be plugged and assessed.

Tribe or Nation	Type of Tribal Grant Awarded	Estimated Wells Assessed*	Estimated Wells to be Plugged**	Total Grant Award Amount
Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation	Program Development: \$1,000,000 Tribal Implementation: \$1,344,014	117	7	\$2,344,014
The Chickasaw Nation	Tribal Implementation	5	N/A	\$86,253
Chippewa Cree Indians of the Rocky Boy's Reservation	Program Development	155	N/A	\$1,000,000
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	Program Development	66	N/A	\$1,000,000
Kiowa Indian Tribe of Oklahoma	Tribal Implementation	N/A	48	\$4,735,765
The Muscogee (Creek) Nation	Program Development	166	N/A	\$997,662
Navajo Nation	Tribal Implementation	N/A	21	\$4,976,586
Osage Nation	Program Development: \$1,000,000 Tribal Implementation: \$18,100,414	N/A	290	\$19,100,414
Otoe-Missouria Tribe of Indians	Tribal Implementation	N/A	48	\$4,642,620
Southern Ute Indian Tribe	Tribal Implementation	50	N/A	\$497,850
GRAND TOTAL		559	414	\$39,381,164
*Assessed = Pre-plugging activities such as discovery, identification, inventory, and assessment				
**To be Plugged = Well will be plugged to relevant applicable standard				
N/A = not applicable				

During the 2023 application period, the Department met with the Tribes and the Bureau of Indian Affairs - Indian Energy Service Center to consult and collaborate on the following for the Tribal program:

-
- Orphaned Well Tribal Grant Guidance Webinar, December 2022;
 - Best Management Practices – Grant Awards Webinar, December 2022; and
 - Technical Assistance through Weekly Office Hours with the Tribes in December 2022 and January 2023.

This collaboration will continue with the next phase of Tribal grants. Building upon the \$39.4 million awarded to Tribes during Phase 1, the OWPO will provide Technical Assistance for Phase 2 Tribal grants, publish Phase 2 Tribal grants guidance, and conduct a Phase 2 Tribal grant application period, culminating with award of Phase 2 Tribal grants in FY 2024.

Section 2: Inventories of Orphaned Wells

The extent of orphaned wells across the United States is not fully known. While many states, federal agencies, and organizations have developed estimates of orphaned well inventories, a comprehensive national inventory does not exist. Moreover, the large existing data gap between the amount of documented and undocumented wells creates challenges in well plugging efforts. Also, the number of orphaned oil and gas wells in the United States is not static. Well status may change for several reasons, including:

- A liable operator is identified and held financially responsible for plugging the well;
- Orphaned wells may change from being undocumented to documented; and/or
- A company bankruptcy might lead to the orphaning of wells.

In FY 2023, the OWPO began development of an approach to create a comprehensive inventory of orphaned wells across the United States. Such an approach will enable collecting important data points on state, federal, and Tribal wells, as well as automating the process of recognizing remediation and plugging opportunities. The Department can collect data from federal, state, and Tribal land managers through the grant application process, quarterly reporting, and field observation during well plugging. In some cases, orphaned wells can be identified during well plugging activities funded by Bipartisan Infrastructure Law investments. Due to the many data sources and fluid nature of well statuses, this process of data collection is burdensome, and more work is required to create a comprehensive inventorying system.

The OWPO has developed a standard set of data to be collected through the reporting efforts for the federal, state, and Tribal programs. Critical quantitative and qualitative data are collected as part of this reporting, including well identification and type, surface and mineral managing entities, latitude and longitude, pre-and post-plugging methane measurements, habitat restoration, surface water, groundwater and soil contamination impacts, and community impacts. This information assists the program in evaluating the effects of orphaned wells and provides a complete picture of each well's circumstances. Data reporting format and frequency vary by program, but all recommended and required reporting addresses statutory reporting requirements and advances efforts to build the orphaned wells inventory.

As specified by the IOGCC, a “documented” well is a well for which the state or regulatory agency has a drilling report, completion report, inspection report, or other record establishing the existence of the well, including its precise location. An “undocumented” well refers to a well that is entirely unknown to a state or agency or one for which a state or agency has some evidence but requires further verification.¹³ The BIL orphaned well investment includes \$30 million for the U.S. Department of Energy to develop a program around identifying, characterizing, and reducing the impacts of undocumented orphaned wells.¹⁴ The IOGCC estimates there are 310,000 to 800,000 undocumented orphaned wells in the United States. Data from the USGS published in 2022 sets the documented orphaned well inventory at

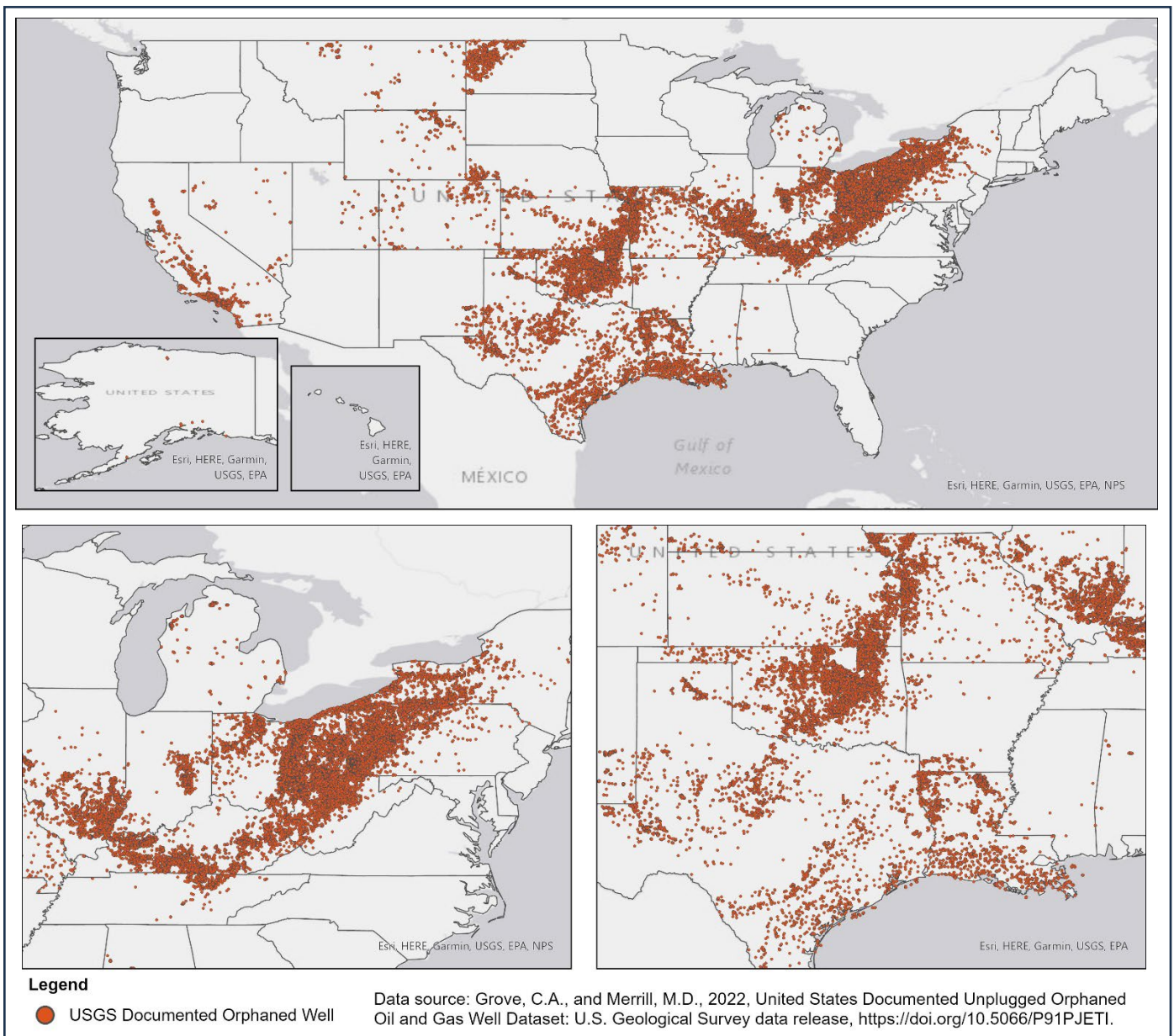
¹³ Interstate Oil and Gas Compact Commission: [Idle and Orphan Oil and Gas Wells: State and Provincial Regulatory Strategies 2021](#).

¹⁴ U.S. Department of Energy: [Consortium Advancing Technology for Assessment of Lost Oil & Gas Wells](#).

117,672 wells across 27 states.¹⁵ **Figure 16** illustrates the 117,672 wells from the USGS dataset, as collected from the states.

The U.S. Environmental Protection Agency (EPA), Environmental Defense Fund, BLM, IOGCC, and USGS have developed estimates of orphaned wells across various jurisdictions, although these values differ based on data collection and methodology. The process of inventorying wells relies on the categorization of a well as orphaned, abandoned, idled, or an alternative category. These categorizations vary between organizations as the definition of “orphaned” is not uniform. The uncertainty of the estimated number of total documented and undocumented orphaned wells highlights the challenge that the OWPO faces in administering financial assistance to support plugging, remediating, and reclaiming orphaned wells.

Figure 16: USGS orphaned well inventory locations with focus maps showing high concentration areas.



¹⁵ U.S. Geological Survey (08/22/2022): [United States Documented Unplugged Orphaned Oil and Gas Well Dataset](https://doi.org/10.5066/P91PJET1).

State and Tribal Programs Inventory of Orphaned Wells

The Department provided Bipartisan Infrastructure Law funding recipients with an Orphaned Well Data Reporting Template (Template) for use in reporting data associated with activities completed using BIL funds. State Initial grant recipients were encouraged to track data for actions taken using BIL funding with the option to utilize the provided Template or other existing systems such as the Groundwater Protection Council's Risk-Based Data Management Solutions (RBDMS).

126,806
documented
orphaned wells
were reported
by 26 states.

Table 4: Number of orphaned wells by state as reported in the December 2021 Formula grant notice of intent.

State	Number of Orphaned Wells
Alabama	91
Alaska	12
Arizona	245
Arkansas	425
California	5,356
Colorado	625
Illinois	4,415
Indiana	1,459
Kansas	5,477
Kentucky	11,728
Louisiana	4,605
Michigan	439
Mississippi	14
Missouri	4,849
Montana	279
Nebraska	471
New Mexico	1,741
New York	4,897
North Dakota	186
Ohio	19,662
Oklahoma	17,865
Pennsylvania	26,908
Texas	7,396
Utah	41
West Virginia	6,309
Wyoming	1,311
TOTAL	126,806

Based on data submitted in Formula grant notices of intent in December 2021, 26 states reported having 126,806 documented orphaned wells. These wells are listed by state and shown in **Table 4**. With the expected award of the Phase 1 State Formula grants in FY 2024, states will be required to track and report data including well location, pre-and-post plugging methane emissions, and surface water and groundwater contamination to ensure all needed data is being consistently captured. Data tracking may be accomplished through existing systems such as the RBDMS but will need to be reported using the Template for quarterly and final reporting.

Tribal grant recipients are required to track data for all actions taken using orphaned well grant funding, which may be accomplished through existing systems such as the RBDMS or provided to the Department in a compatible format, including the Template, for entry into a centralized database. The OWPO's data collection processes continue to be optimized to create greater data accessibility and evaluate program progress.

Federal Program Inventory of Orphaned Wells

To facilitate the inventory, the Federal Orphaned Wells Database was created for program data to be stored in the Office of Environmental Policy and Compliance Environmental Management Information System (EMIS). This database serves as a project tracking tool for federal agencies and allows Geographical Information System analysis of field-collected data to track program metrics, evaluate progress, and provide accurate information for program reporting. Users can request funding under the BIL, track funds, and document methane levels and other information required for the annual

report to Congress. Enhancement of web-based functionality and internal controls are underway to make this database the official system of record for the Federal Program. The Federal Orphaned Well Database in EMIS currently includes data for 599 wells on federal land, with fields for:

- BIL-funded activity (plugging/non-plugging);
- Surface and subsurface managing entity;
- Geographic location;
- Community impact;
- Well status (plugged/unplugged);
- Orphaned status;
- Methane emissions; and
- Rankings for risk mitigation and benefits from plugging (i.e., public health and safety, environmental harm, impacted media, bureau's land use priorities, and environmental justice).

FY 2023 Initiatives for Inventorying of Orphaned Wells

In FY 2023, OWPO developed partnerships with USGS and an IT consulting firm to further facilitate the development of the orphaned well inventory and build upon current data collection efforts. Kicking off work in FY 2024, USGS will continue its work inventorying orphaned wells and building upon its current documented orphaned well dataset, which was originally published in 2022.¹⁵ In the partnership, USGS will focus on key areas of inventorying orphaned oil and gas wells, analyzing plugging and remediation activities and associated reductions in emissions, and providing information to support future methods to prioritize locations and wells for plugging. USGS is already assisting in some of these efforts using existing financial resources, although additional funding by OWPO will place further focus on the inventory of State Programs data. USGS will use IT support to create a public-facing orphaned wells inventory map and dashboard to convey the inventory as well as the associated economic and environmental impacts of the mapped orphaned wells.

This past year's work resulted in the implementation of greater inventory and

Figure 17: A recently plugged well in Roane County, West Virginia, with residences in the background. Photo taken during an OWPO site visit.



data collection efforts. Ultimately, these steps will advance OWPO’s mission of reducing methane emissions, preventing groundwater and surface water contamination, and eliminating health and safety hazards by identifying, plugging, remediating, and restoring orphaned oil and gas wells and well sites.

Wells at Risk of Becoming Orphaned

Understanding which wells across the country are at risk of becoming orphaned is critical to preventing future orphaned wells and limiting potential taxpayer liability. The OWPO continues to explore methods to identify and evaluate if a well is at significant risk of becoming orphaned. Data collected in the first and second year of the Orphaned Well Program will help develop the methodology that will be applied to at-risk-wells for future reporting metrics. In FY 2023, the Department emphasized the importance of inventorying and addressing idled wells, which in many cases can be used as a proxy for wells at risk of becoming orphaned. The problem posed by idled wells is illustrated in the State of Louisiana, which has an estimated 16,000 “idle” wells that have yet to be categorized as orphaned.¹⁶ While these wells are either designated by the operator as idled or have not produced hydrocarbons in the past five years, they also have not yet been identified as properly abandoned or plugged.

Section 40601(b)(3) of the Bipartisan Infrastructure Law requires the Director of the BLM to periodically review and reduce the inventory of idled wells on federal land. An idled well on federal land is defined as a well “that has been nonoperational for not fewer than 4 years and for which there is no anticipated beneficial future use.” BLM is taking steps to reduce idled wells through the proposed “Onshore Oil & Gas Leasing Rule”. Released in July 2023, this rule would require the operators of currently nonoperational wells to help BLM reduce its inventory of idled wells through improved identification, tracking, and proactive management.¹⁷ As of September 30, 2023, there are 8,454 federal idled wells managed by the BLM.

The efforts by BLM on idled wells and the OWPO’s partnership with USGS on identification and description of abandoned wells will facilitate a review of national wells that are at risk of becoming orphaned. As an inventory continues to be developed, OWPO will leverage knowledge of abandoned and idled wells and the collected data to analyze and mitigate wells at risk of becoming orphaned.

Through Regulatory Improvement grants, the BIL provides an incentive for states to reduce the risk of future orphaned well burdens by implementing regulatory improvement measures such as financial assurance reform, alternative funding mechanisms for orphaned well programs, and reforms to programs relating to well transfer or temporary abandonment. The BIL also provides an opportunity for states to protect groundwater and other natural resources, public health and safety, and the environment by strengthening their plugging standards and procedures designed to ensure that wells located in the respective State are plugged in an effective manner.

¹⁶ Center for Energy Studies at Louisiana State University (3/31/2023): [Progress Report: Oilfield Site Restoration using IJJA Funds](#).

¹⁷ Bureau of Land Management (7/20/2023): [Interior Department Takes Steps to Modernize Oil and Gas Leasing on Public Lands, Ensure Fair Return to Taxpayers](#).

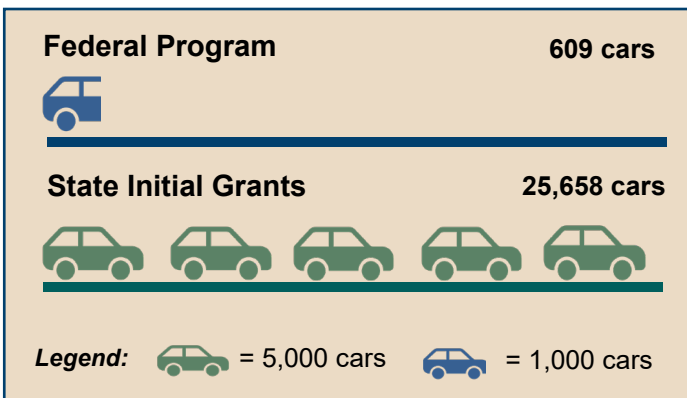
Section 3: Methane Emissions

As the wellbore of an orphaned well corrodes over time, gases can migrate from underground formations to the surface. Harmful gases can escape into the atmosphere by leaking from open wellbores, subsurface fractures in the well casing, valves, connectors, cracks at old wellheads, other old infrastructure, or soils surrounding the well. These gases can include methane, which is the primary component of natural gas and a potent greenhouse gas that is a significant cause of climate change. The plugging and remediation of orphaned wells funded under Section 40601 of the Bipartisan Infrastructure Law will result in a reduction of methane emissions and other pollutants, improving public health and mitigating climate change.

*Methane is **80** times more potent of a greenhouse gas than carbon dioxide.*

As outlined in the Methane Measurement Guidelines issued in 2023, emissions information provided as part of the State Program Initial grants and Federal Program is ongoing and will be utilized to better understand potential methane reductions data for prioritizing future BIL funded orphaned well projects. This information will also provide background on the importance of oil and gas well plugging and remediation central in achieving the goals of the U.S. Methane Emissions Reduction Action Plan.

Figure 18: Annual vehicle greenhouse gas emission equivalents estimated to be eliminated over 10 years through plugging orphaned wells found to be leaking methane as of June 30, 2023.



In accordance with the original Methane Measurement Federal Program Guidelines issued on April 11, 2022, pre-plugging methane emissions measurements have been conducted for 12 BLM and 100 FWS orphaned wells on federal land. Combined methane emission rates from 29 of the wells where methane was detected are equal to approximately 274 metric tons of carbon dioxide (CO₂)-equivalent per year, or 2,735 metric tons of CO₂-equivalent projected over the course of 10 years, equal to the greenhouse gases emitted from 609 gasoline-powered passenger vehicles driven for one year, as shown in **Figure 18**. Additional methane reduction information from

federal partners is provided in the Federal Program Methane Measurements subsection below.

Based on information provided in State Initial Grant Quarterly Performance Reports, as of June 2023, combined annual pre-plugging methane emission rates from a total of 497 wells measured in California, Colorado, Louisiana, and New Mexico are equal to approximately 11,530 metric tons of CO₂-equivalent per year, or 115,299 metric tons of CO₂-equivalent over the course of 10 years. This 10-year total is equivalent to greenhouse gases emitted from 25,658 gasoline-powered passenger vehicles driven for one year, representing the methane

emissions that will be reduced following the plugging of the 497 orphaned wells (**Figure 18**). **Table 5** details the pre-plugging emission equivalents for the 497 wells and post-plugging methane emissions data available for 328 wells that have been plugged as of the date of this report. The data gathering process is still underway, and as additional wells are identified and pre-plugging methane emissions are monitored, this number is anticipated to rise.

Federal Program Methane Measurements

Based on pre-plugging methane emission measurements, methane emissions were detected at 29 out of 112 orphaned wells, or approximately 26 percent, at rates ranging between less than 1 gram per hour (g/hr) to 369 g/hr. Methane emissions were confirmed to be eliminated via post-plugging methane monitoring at all 12 BLM wells where pre-plugging methane emission data was reported.

State Initial Grant Methane Measurements

As detailed in the Methane Measurement Guidelines subsection below, it was recommended but not required for states to record methane emissions under the Initial grants. However, methane emissions will be required to be measured under Formula grants. Approximately ten out of the 24 states that received Initial grant funds are voluntarily detecting, measuring, and recording methane emissions during well plugging as noted in site visit observations and states' Quarterly Performance Reports. **Table 5** provides a summary of methane emission data reported by California, Colorado, Louisiana, and New Mexico.

Table 5: Summary of state pre- and post-plugging methane emission greenhouse gas equivalences.

BIL Program Participant	Number of Wells with Pre- and/or Post-Plugging Methane Emission Data	1-Year Projection		10-Year Projection	
		CO ₂ -Equivalent (Metric Tons)	Emissions from Gasoline-Powered Vehicle Driven for 1 Year	CO ₂ -Equivalent (Metric Tons)	Emissions from Gasoline-Powered Vehicle Driven for 1 Year
California	122	53.5	11.9	535	119
Colorado	23	9,960	2,216	99,599	22,164
Louisiana	295	25.2	5.6	252	56.2
New Mexico	57	1,491	332	14,913	3,319
TOTAL STATE PRE-PLUGGING EMISSION EQUIVALENT	497	11,530	2,566	115,299	25,658
TOTAL STATE POST-PLUGGING EMISSION EQUIVALENT	328	0.07	0.02	0.73	0.16

Pre-plugging emission equivalent based on data provided for 497 wells, as depicted individually by the number of wells listed for California, Colorado, Louisiana, and New Mexico. Post-plugging emission equivalent based on data provided for 328 wells in California, Colorado, Louisiana, and New Mexico.

Post-plugging measurements have been reported for 328 of the 497 wells where methane was detected and measured before plugging, showing greater than 99.999 percent effectiveness in methane reduction. The following provides additional detail on the data reported by the states as of June 30, 2023.

- 1. California:** California identified 171 wells to-be-plugged and plugged 61 orphaned wells. Pre-plugging methane emissions monitoring was conducted on 122 wells, with methane detected at 21 wells, or approximately 17 percent. Detected methane emission rates range from 0.06 g/hr to 80 g/hr.
- 2. Colorado:** Colorado plugged 29 orphaned wells as of June 30, 2023. Pre-plugging methane emissions monitoring was conducted on 23 wells, with methane detected at 15 wells, or approximately 65 percent. Detected methane emission rates range from 0.7 g/hr to 33,153 g/hr, with several wells identified as potential super emitters. Colorado is continuing to develop a full-scale plan for methane monitoring as of June 2023. The Colorado Energy & Carbon Management Commission attempted several different measurement methods for pre-plugging emissions and completed measurements at some wells more than once. Colorado used its own funds to support Colorado State University staff to conduct pre-and-post-plugging data collection.
- 3. Louisiana:** Louisiana plugged 296 orphaned wells, with pre- and post-plugging methane emission monitoring data available for 295 wells. Detected pre-plugging methane emission rates range from 0.001 g/hr to approximately 48.6 g/hr, with methane detected at 23 of the 295 wells, or approximately 7.8 percent. Two of the wells account for approximately 97.5 percent of the total emissions. No methane was detected at any of the wells post-plugging. The Louisiana Department of Natural Resources (LDNR) continues methane measurement operations with site contractors and Louisiana State University (LSU). LSU has gathered preliminary findings on methane measurement and is developing an online tool to track methane and other critical BIL metrics. Furthermore, LSU recently completed its design and build of a 24-hour methane detection system and implemented the system in the field in July 2023.
- 4. New Mexico:** New Mexico plugged 63 orphaned wells using Initial grant funds, with methane emission monitoring conducted at 57 wells and methane detected at 40 wells, or approximately 70 percent of the wells measured. Detected methane emission rates range from 0.001 g/hr to 5,263.75 g/hr. One well qualified as a super-emitter and represented approximately 95 percent of the combined

Figure 19: Louisiana contractor measuring methane emissions from a high emitting orphaned well in Union Parish, Louisiana.



methane emissions. Post-plugging methane monitoring has been completed at 25 of the 57 wells, with methane detected at six wells at rates ranging from 0.01 g/hr to 0.19 g/hr representing a nearly 99.99 percent total reduction in methane emissions.

These results substantiate the importance of plugging high-risk orphaned wells to address methane emissions, which is further discussed as a strategy to address climate change below. Other Initial grant recipients that are tackling the challenge of detecting, measuring, and quantifying methane emissions from orphaned wells include Kentucky, North Dakota, Florida, Indiana, Mississippi, Montana, Nebraska, and New York. Methane emissions reductions from State Program activities will continue to be quantified and included in future reports.

Methane Measurement Guidelines

The EPA's 2021 Greenhouse Gas inventory estimates that approximately 40 percent of the abandoned oil and gas wells in the United States are unplugged and may be continuously emitting methane.¹⁸ As noted in the U.S. Methane Emissions Reduction Action Plan, unplugged or poorly plugged wells can also allow petroleum products to leach into aquifers, release hazardous air pollutants, and cause methane to concentrate inside homes and buildings, creating a risk of explosion.¹⁹ Methane is 80 times more potent of a greenhouse gas than CO₂, and other volatile organics released along with methane can contribute to serious public health impacts, from asthma to cancer to premature death. Methane leaks amount to billions of dollars of wasted natural gas every year in the United States, with 30 percent of methane emissions coming from the oil and gas sector.

There are multiple types of methane leaks that can occur at orphaned wells. Methane leaks may occur at an open well hole either through the well hole only or through the well hole and soils around the well hole due to subsurface fractures in the well bore. Leaks can occur through valves, connectors, or cracks at a legacy well head or other infrastructure associated with the well. Emissions can also occur within the soils surrounding the well bore instead of the well opening, or at the well opening after a heavy rainfall event or after snowmelt in the spring when the groundwater forces methane that has permeated into the soil back into the well hole. Methane emissions continue to be a high priority as the Biden-Harris Administration ramps up efforts to reduce greenhouse gas emissions to address the climate crisis.

In July 2023, the White House held a Methane Summit focused on reducing emissions, especially from leaks in the oil and gas sector, to protect public health, create good-paying jobs, save consumers money, and accelerate the Biden-Harris Administration's ambitious climate agenda. The Summit marked the establishment of a new Cabinet-level Methane Task Force, which will meet quarterly to deliver on the U.S. Methane Emissions Reduction Action Plan and advance the whole-of-government approach to proactive methane leak detection and data transparency and support state and local efforts to mitigate and enforce methane emissions regulations.¹⁹

The Task Force's approach and focus includes methane mitigation through remediation of orphaned wells, including tracking and mitigation of super emitters. Super emitters are extraordinarily large individual sources of methane that account for a significant portion of oil

¹⁸ U.S. EPA (4/14/2021): [Inventory of U.S. Greenhouse Gas Emissions and Sinks](#).

¹⁹ White House Office of Domestic Climate Policy (11/2021): [U.S. Methane Emissions Reduction Action Plan](#).

and gas supply chain emissions. These super emitters are not fully captured by existing regulatory frameworks, but, through the Methane Task Force, existing investments and initiatives will be evaluated to integrate advanced methane monitoring techniques to track and mitigate super emitters, including the wells plugged under the Orphaned Wells Program.

The State Initial grant guidance makes measurement and tracking of emissions of methane voluntary but recommended that states include details related to methane measurement and well prioritization in their Initial grant applications. States receiving Formula grant funds will be required to conduct an inspection of each orphaned well site considered under the grant to screen for leaks of methane and other gases, and, if identified, to measure the rates of such leaks (pre-plugging measurements). Post-plugging inspections within 12 months of the plugging activity are also required to verify the lack of gaseous emissions. These inspections required for Formula grant-funded activities must follow the Department's Methane Measurement Guidelines, which are anticipated to evolve over time as the technology and approaches for methane detection, quantification, and monitoring improve.²⁰

For field activities using Tribal grants, applications must include the methodology to be used to measure and track methane and other gases associated with orphaned wells, including how the Tribe will confirm effectiveness of plugging in reducing or eliminating emissions.¹²

States will be required to report pre- and post-plugging values of gaseous emissions, particularly methane, in Formula grant quarterly and final performance reports. Similarly, Tribes will be required to conduct pre- and post-plugging emissions measurements and report on the findings in their final performance report.

In July 2023, the OWPO issued updated Methane Measurement Guidelines (Guidelines) for federal, state, and Tribal government agencies to use in meeting the reporting requirement for methane emissions reductions.²⁰ The updated Guidelines serve as the minimum standard for measuring methane emissions for pre- and post-plugging methane emissions from orphaned wells. The updated Guidelines are applicable to all Tribal grant and Formula grant award recipients. Federal contracts already awarded for well-plugging or methane emissions measurement that reference the April 2022 guidelines may continue to use that version. The Guidelines recommend data measurement objectives and quality assurance criteria that will meet Federal Program information needs.

The Guidelines are designed to provide quantitative measurements of methane emissions rates that meet program data quality objectives and can be aggregated to meet reporting requirements of the BIL (Title VI, Section 40601(f)(2)(B)) for methane emissions reduced by plugging and support the calculation of nationwide inventory measures and emissions factors. The updated Guidelines include a reference to the approved American Carbon Registry Protocol as a suitable alternative protocol for measuring emission rates. According to the American Carbon Registry Protocol, quantification of project emission reductions requires calculation of baseline emissions and project emissions.²¹

²⁰ Orphaned Wells Program Office (07/2023): [Methane Measurement Guidelines](#).

²¹ American Carbon Registry (05/24/2023): [Methodology for the Quantification, Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removal from Plugging Orphan Oil and Gas Wells in the U.S. and Canada](#).

Key Updates to the Methane Measurement Guidelines

Updated July 2023 Guidelines for methane measurement at orphaned wells considers the sensitivity and appropriate application of three different measurement methods:

- **Satellite-mounted sensors**
“Greenhouse Gas Emissions Monitoring Service” and “Tropospheric Monitoring Instrument” sensors typically focus on global and regional areas.
- **Aerial technologies**
Unmanned aerial vehicles and airplanes coupled with various sensors can typically measure methane emissions in the 100 – 1,000 kilograms per hour range.
- **Ground-based techniques**
Direct-emission measurement techniques that require an individual to be present at the well site using hand-held natural gas detectors, high-flow samplers, and flux chambers.



The Guidelines Define Four Types of Wells:

Type 1 is a well that can be easily covered by a portable chamber.



Type 2 is a well that has legacy infrastructure attached and an aggregate flow rate measurement can be obtained similar at each leaking component.



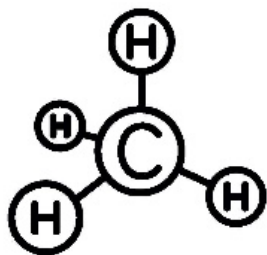
Type 3 is a well that has legacy infrastructure attached and due to the complexity, height, or other factors, cannot have flow rate measurements conducted.



Type 4 is a well that cannot have flow rate measurements conducted and cannot have estimates conducted due to safety or inaccessibility.



The Guidelines provide an updated two-part screening process for methane measurement.



Part 1: Screening Protocol

Identifies methane as not detected, detected, or detected/may be high. If methane emissions are not detected, then the rate would be recorded as less than 1 g/hr and no further effort would be required.

Part 2: Flow Rate Measurement

Applied to quantify the methane detection as described in the main protocol by the qualified measurement specialist.

These updates to the OWPO Methane Measurement Guidelines support a better understanding of the relationship between methane and orphaned wells through the collection of both quantitative and qualitative data while specifying an efficient decision process for methane measurement.

Section 4: Economic Opportunities

The total FY 2022 and FY 2023 obligations by the Department and USFS for Section 40601 were \$647.6 million. The activities funded by these obligations are estimated to support 7,213 jobs and contribute \$934.5 million to the economy. The annual data, generated by models developed by the Department’s Office of Policy Analysis, are summarized in **Table 6**.

Table 6: Jobs supported and Gross Domestic Product (GDP) contributions from FY 2022 and FY2023 obligations.

Bipartisan Infrastructure Law Program	FY 2022		
	Obligations	Jobs Supported	Contributions to GDP
Federal Program	\$19,825,000	208	\$28,999,258
State Initial Grants	\$560,000,000	6,225	\$807,204,218
Tribal Grants	\$0	0	\$0
FY 2022 SUBTOTAL	\$579,825,000	6,433	\$836,203,476

Bipartisan Infrastructure Law Program	FY 2023		
	Obligations	Jobs Supported	Contributions to GDP
Federal Program	\$28,419,216	313	\$40,576,749
State Initial Grants	\$0	0	\$0
Tribal Grants	\$39,381,000	467	\$57,710,612
FY 2023 SUBTOTAL	\$67,800,216	780	\$98,287,361

Bipartisan Infrastructure Law Program	TOTAL		
	Obligations	Jobs Supported	Contributions to GDP
Federal Program	\$48,244,216	521	\$69,576,007
State Initial Grants	\$560,000,000	6,225	\$807,204,218
Tribal Grants	\$39,381,000	467	\$57,710,612
TOTAL	\$647,625,216	7,213	\$934,490,837

The economic contributions were estimated using IMPLAN, an economic analysis software application designed to estimate the impacts or “ripple” effects of a given economic activity. The methodology for developing the estimates in this report differ from those used in the previous report in two ways: last year’s report used a 2019 IMPLAN data year compared to the 2021 data year used in this report and in this report, expenditures are equivalent to obligations as reported in the Department’s financial system. Adopting this revised approach ensures that the economic contribution methodology is consistent with other Bipartisan Infrastructure Law programs.

Supporting workers and growing the workforce involved in well plugging, remediation, and restoration activities across the country is central to the Department's efforts to implement Section 40601 of the Bipartisan Infrastructure Law. To further these efforts, the Orphaned Wells Program partners with the Energy Communities Interagency Working Group, which is designed to foster relationships between federal partners and community leaders and ensure federal programs work for communities' efforts to transform and grow their economies.

The Bipartisan Infrastructure Law's investment in orphaned well clean-up has catalyzed numerous workforce initiatives, as has the administration of these funds; for instance, the Department included language in the Phase 1 State Formula Grant Guidance encouraging states to incorporate strong labor standards and use a well-trained project workforce for plugging, remediation and reclamation of wells.⁸ And with states ramping up well-plugging and remediation efforts this year because of investments from the BIL, workers are benefiting as companies expand to take on new projects.

- Headquartered in West Virginia and active across Appalachia, Hydrocarbon Well Services was awarded one of the first contracts in the Commonwealth of Pennsylvania funded by President Biden's Bipartisan Infrastructure Law to clean up orphaned oil and gas wells. Brian Jarvis, the President of Hydrocarbon, met with Secretary Haaland in the Pittsburgh area on February 9, 2023, and shared the impact this funding has on his company and employees: "My company is small, we have 25 employees right now, and we believe that this funding under the Biden-Harris Administration and Secretary Haaland is going to be huge for our company long term. We've already been able to increase wages for our employees, almost double what they used to be. This is a game changer also for them, with their homes and with their families."
- A contractor managing well-plugging efforts in Louisiana has partnered with the Louisiana Chamber of Commerce Foundation to develop worker and company outreach plans to help promote and incorporate more small and disadvantaged businesses and Black, Indigenous, and People of Color owned companies in well-plugging efforts.
- Pennsylvania's Governor Josh Shapiro created the Commonwealth Workforce Transformation Program to invest a portion of BIL funds into on-the-job workforce training.
- California created an oil and gas well-capping pilot initiative to assist state-registered apprenticeship programs in developing curricula for training apprentices and to upskill journeypersons on well-capping projects. California has noted that the recent and unprecedented level of federal funding for well plugging is an opportunity the State will leverage to provide high-quality job opportunities for those transitioning out of oil and gas production.

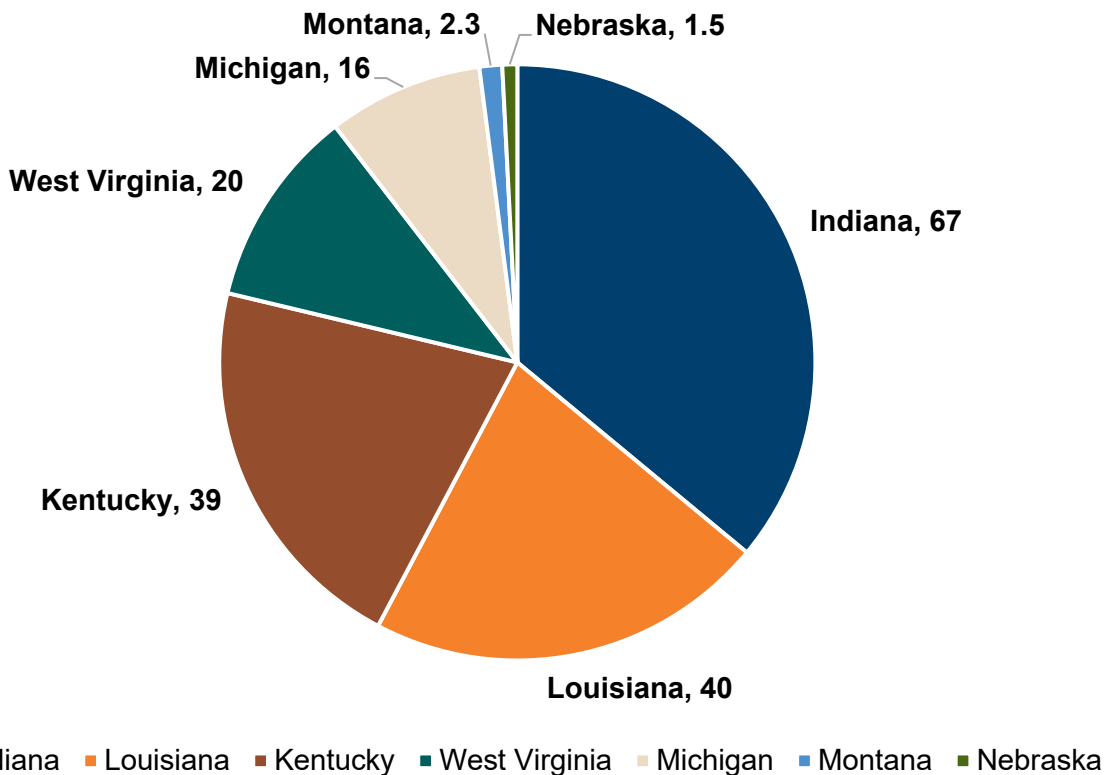
As orphaned well plugging and remediation projects expand nationwide and investments continue to reach communities, the Department's Orphaned Wells Program will center workers and the creation of good jobs at the heart of its efforts.

Section 5: Habitat Restoration

Habitat restoration is a marker of the final stages of orphaned well plugging and remediation. Accordingly, there is often significant lag time between well plugging and abandonment and habitat restoration. Of the wells plugged on federal, state and private lands using Bipartisan Infrastructure Law funds to date, only a fraction reached the habitat restoration phase, and, as such, the picture of eventual habitat restoration is incomplete. At the time of this report, 185 habitat acres have been restored following the plugging and abandonment of 867 wells on state and private lands (**Figure 20**). The remaining wells plugged either do not require habitat restoration or have not reached that phase. For the 113 wells plugged to date on federal lands, habitat restoration has not yet occurred. This data remains a priority for the OWPO, and a metric for acres of habitat restored is included in the data reporting template provided to federal land managers, states, and Tribes.

185 habitat acres have been restored from plugging and abandonment of 867 wells on state and private lands.

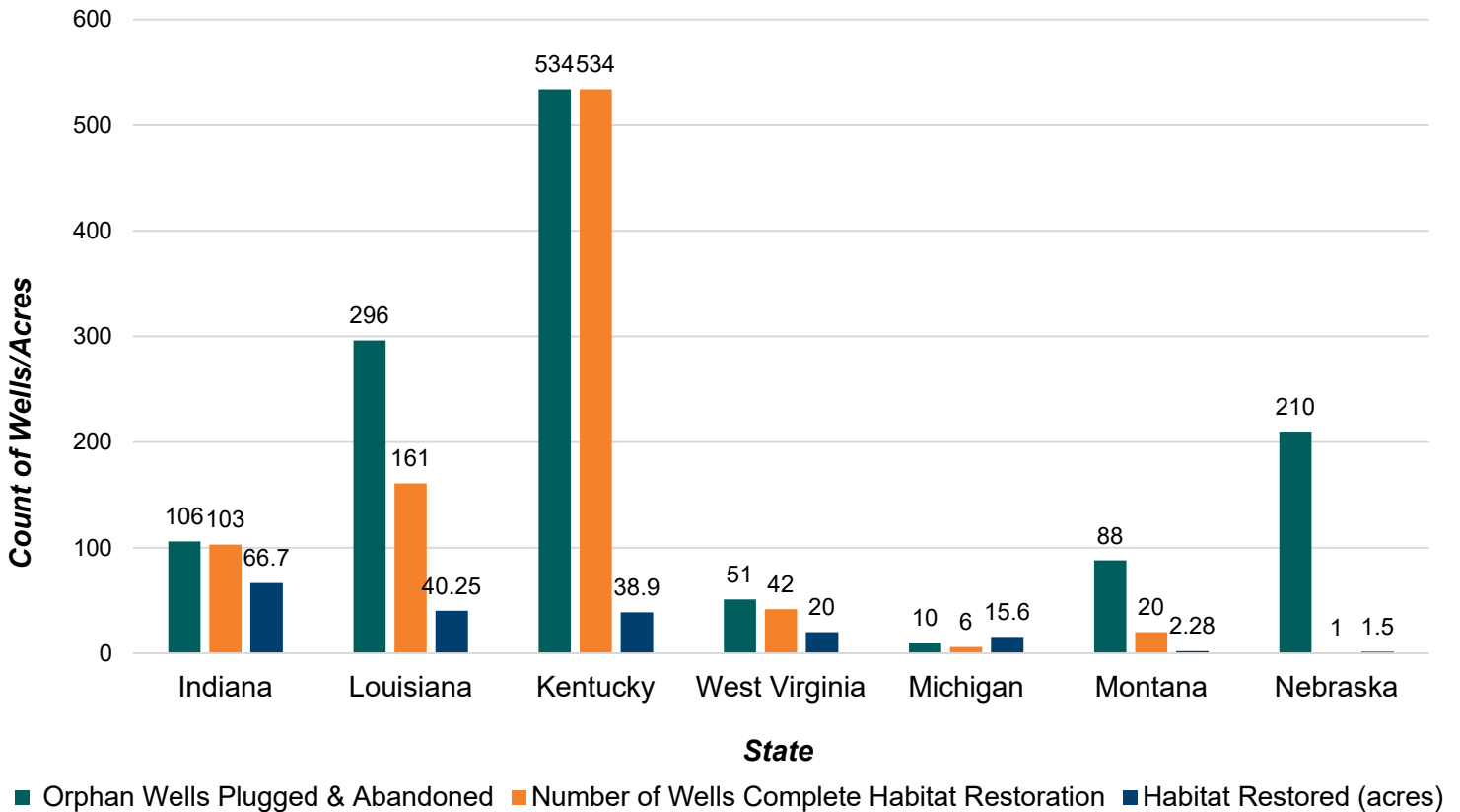
Figure 20: Acreage of habitat restored using State Initial grants through June 2023.



Data for habitat acres restored as reported in the States' Quarterly Progress Reports may not be representative of the total benefit to habitat restoration from plugging, as states were not required to track and report this data for the Initial grants. Two additional states reported wells with habitat restoration without quantifying the acres restored. Future awards, including the State Formula grants, will require this data to be tracked and reported.

As of June 30, 2023, Indiana, Kentucky, Louisiana, Michigan, Montana, Nebraska, and West Virginia have provided data on their progress in habitat restoration using State initial grants, including acreage of habitat restored. **Figure 21** provides a breakdown of states that reported progress with plugging, wells with habitat restoration completed, and acres restored.

Figure 21: State plugged wells with restoration and habitat acres restored.



For projects funded in FY 2022 that began in FY 2023, some states provided interim updates of habitat restored and identified challenges faced during plugging and reclamation of orphaned wells in their quarterly reports. For example, Kansas reported that a total of 1,243 orphaned wells were plugged; however, its quarterly progress report indicated challenges with restoration of the well sites due to weather and access issues caused by landowners. These challenges delayed project execution, therefore delaying revegetation efforts. State quarterly reports include details on the following issues or circumstances contributing to delayed plugging or delayed habitat restoration:

- Alaska encountered access problems when relocating heavy machinery, coupled with soil conditions. To address this, Alaska devised a strategy to initiate the plugging and abandonment of the well sites during the upcoming winter season to make the most of the frozen ground conditions and facilitate the movement of heavy equipment.
- California encountered project challenges due to the conservation of local tiger salamander habitats.
- Florida encountered significant project complications stemming from the aftermath of Hurricane Ian. This event affected multiple counties throughout Florida, causing

infrastructure damage, disrupting supply chains and resource allocation to emergency responders, all of which significantly slowed down well restoration efforts.

- In Nebraska, notable project difficulties arose due to unusually heavy snowfall and prolonged cold temperatures, hampering the mobility of personnel, equipment, and materials essential for the completion of well restoration efforts.

As progress continues with Federal Program and State Initial grant plugging and remediation, and as more funds are distributed through State Formula grants, Tribal grants, and the Federal Program, the Department's quantitative data for acreage of habitat restored will continue to develop and provide greater indication of the ecological benefit of BIL orphaned well plugging and remediation funds.

Figure 22: Photos from OWPO site visit in Caddo Parish, Louisiana.



Photo Description: (Left) Storage tanks and orphaned oil wells located on pastoral land. **(Right)** Cattle graze nearby. At least one residence is located on the site, with numerous residences near the site.

Section 6: Accomplishments and Future

Environmental Justice

Orphaned well plugging and remediation contributes to the Department's Environmental Justice strategy to meet the needs of communities with environmental justice concerns by reducing disparate environmental burdens, removing barriers to participation in decision making, and increasing access to environmental benefits that help make communities safe, vibrant, and healthy places in which to live, work, learn, and recreate. Investments from the BIL for orphaned wells plugging benefit disadvantaged communities by reducing water contamination, remediating soil, restoring habitat, and reducing harmful methane emissions caused by leaking oil and gas well infrastructure. The orphaned well programs funded by the BIL also provide a direct economic benefit to communities in addition to addressing public health and environmental burdens.

The Orphaned Wells Program is a covered program under the Administration's Justice40 Initiative, which seeks to direct 40 percent of the overall benefits of certain federal investments to disadvantaged communities that are marginalized, underserved, and overburdened by pollution.²² Included in the categories of covered federal investments is remediation and reduction of legacy pollution, including orphaned well plugging, remediation, and restoration.

Orphaned wells plugging and remediation provides direct benefits to communities with environmental justice concerns.

Environmental Justice is addressed in a number of ways as the federal, state, and Tribal orphaned well programs are implemented, and Section 40601 funds are awarded. The BIL specifies that Federal Program and state grant funding recipients may use funding "to identify and address any disproportionate burden of adverse human health or environmental effects of orphaned wells on communities of color, low-income communities, and Tribal and indigenous communities." Providing funding to assess disproportionate burdens on communities with environmental justice concerns positions the Department, federal partners, and states to prioritize plugging in and increase benefits to these communities. Under the Federal Program, when requesting funding and entering an orphaned well in the EMIS Orphaned Well Database, federal partners are required to indicate whether a well is causing a disproportionate burden of adverse human health or environmental effects on communities of color, low-income communities, or Tribal and indigenous communities. Federal partners are directed to use the EPA's Environmental Justice Screening and Mapping Tool (EJScreen)²³ to determine whether a well affects a disadvantaged community, based on distance to nearest community, occupied structure, community impacts, and other factors. EJScreen uses a nationally consistent data set, combining environmental and demographic indicators and maps and reports to help identify communities with environmental justice concerns. In addition to identifying community impacts, federal partners also rank wells based on a variety of factors, including the degree to which the project would address environmental justice and benefit affected communities.

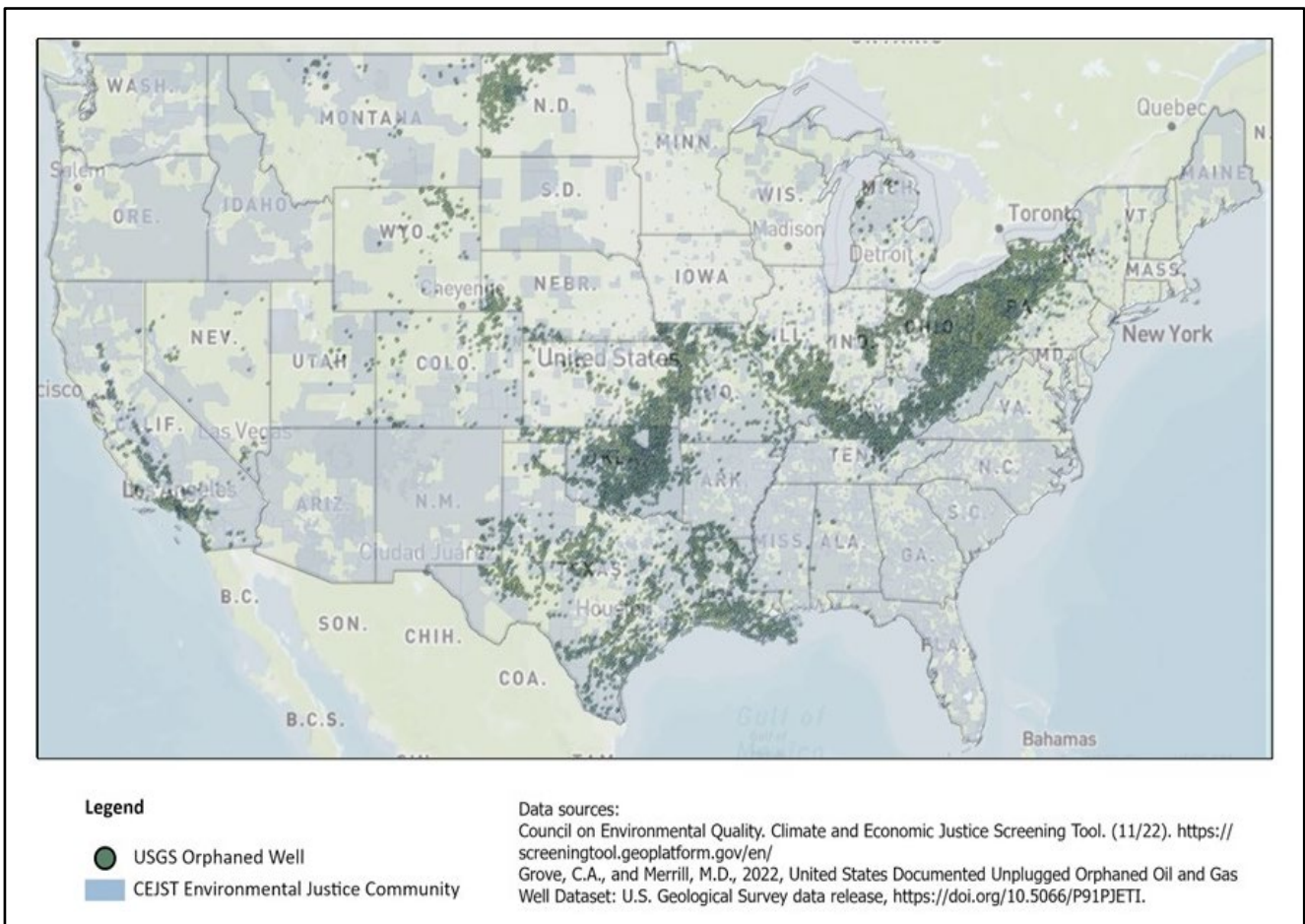
The State Initial Grant Guidance and Phase 1 Formula Grant Guidance reference the Climate and Economic Justice Screening Tool (CEJST) from the White House Council on

²² Department of the Interior: [Justive40 Initiative](#).

²³ U.S. EPA: [EJScreen: Environmental Justice Screening and Mapping Tool](#).

Environmental Quality.²⁴ CEJST, like EJScreen, is a resource that pairs environmental data with socioeconomic burdens to indicate communities with environmental justice concerns by census tract. These mapping tools can be used to determine if documented orphaned and idled wells are within or cause impacts to disadvantaged communities, allowing for this information to be considered during prioritization as funds are awarded and plugging begins. **Figure 23** below shows the communities considered to have environmental justice concerns per CEJST indicators plotted against the 117,672 orphaned wells in the USGS inventory.

Figure 23: USGS orphaned well inventory plotted against CEJST Environmental Justice Communities.



As states continue plugging wells, they will increasingly provide benefits to communities with environmental justice concerns and historic underinvestment. In Louisiana, LDNR is working to increase worker training opportunities for Louisiana’s citizens and to continue to refine and expand benefits for disadvantaged communities with its orphaned wells program. Investments in orphaned well plugging and remediation in Tribal communities work to address the disproportionate environmental and health burdens and historic underfunding that affect Tribal communities.

²⁴ Council on Environmental Quality: [Climate and Economic Justice Screening Tool](https://screeningtool.geoplatform.gov/en/).

Site Visits

In 2023, the “Investing in America” tour and other senior level site visits brought a nationwide spotlight to ongoing efforts to remediate the impacts of orphaned oil and gas wells across the country with Bipartisan Infrastructure Law funding. Secretary of the Interior Deb Haaland traveled to Kansas (**Figure 24**) in July 2023 to highlight investments made through the BIL in the state, which received \$25 million in Initial grant funding and is eligible for another \$25 million through the Phase 1 Formula grants. Secretary Haaland also visited Pennsylvania in February 2023 (**Figure 26**), Texas in March 2023, and Colorado in September 2023 to highlight the historic investments and energy community revitalization.

Department Senior Advisor and Infrastructure Coordinator Winnie Stachelberg and OWPO Director Kimbra Davis toured orphaned well sites in Tullos, Louisiana, in January 2023 with state and local partners. These well sites were some of the first to be plugged in Louisiana with BIL funding. Louisiana received an Initial grant of \$25 million to plug wells on state and private land. Infrastructure Coordinator Stachelberg also toured orphaned well cleanup sites in Michigan (**Figure 25**), Ohio, and West Virginia as part of the “Investing in America” tour.

Figure 24: Secretary Haaland visits an orphaned well site in Kansas with Representative Sharice Davids (D-KS) and Kansas Corporation Commission staff. Photo by the Department.



Figure 25: Infrastructure Coordinator Stachelberg visits orphaned well sites in Michigan with state officials and landowners. Photo by the Department.



Figure 26: Secretary Haaland speaking with Pennsylvania landowners during a February 2023 site visit. An orphaned well on the property was plugged using BIL funds.



Interstate Oil and Gas Compact Commission Consultation

Consistent with Section 40601 of the Bipartisan Infrastructure Law, the Department consulted with the IOGCC regularly throughout FY 2023 to carry out the Department's responsibilities for the federal, state, and Tribal programs. Consulting activities include representatives of the OWPO attending bi-weekly meetings with IOGCC staff and the OWPO attending or participating in the following webinars and/or collaborative events:

- Representatives from the Department attended the IOGCC Annual Conference in Baltimore, Maryland, in October 2022, where they were able to engage with state officials and staff and provide updates on the Orphaned Wells Program.
- March 2023 Webinars and Discussions with States on Data Management Issues and Draft Formula Grant Guidance, hosted by the IOGCC – The OWPO presented information on the Department's draft formula grant guidance and data management challenges and solutions. This facilitated state feedback and gave the IOGCC an opportunity to comment on the draft formula grant guidance.
- The OWPO attended the IOGCC 2023 Annual Business Meeting held in Oklahoma City in May 2023 to discuss orphaned well successes, challenges, and upcoming grant opportunities.
- Technical Assistance on Orphaned Well Grant Applications – In August 2023, the OWPO provided technical assistance to state grant recipients through two separate webinar sessions.

Orphaned Wells Program Outlook

The Orphaned Wells Program will continue to address legacy pollution and community revitalization as plugging, remediation, and restoration activities progress through the federal, state, and Tribal programs described in this report. In FY 2024, the Department projects continued collaboration with federal agencies, states, and Tribes, building on the successes achieved in the first two years of Bipartisan Infrastructure Law Section 40601 implementation.

Based on funding projections, the following estimated obligations are anticipated in FY 2024:

- Federal Program Funding: \$50,000,000;
- State Initial Grants: \$15,000,000;
- State Formula Grants: \$660,000,000;
- Cooperative Agreement with IOGCC: \$1,930,000; and
- Tribal Grants: \$50,000,000.

These anticipated obligations total \$776.9 million, increasing the breadth and scope of orphaned well plugging and associated activities and adding to the work already under way by federal, state and Tribal agencies. FY 2024 will see another round of Federal Program requests and funding award to federal partners in the Department and USFS. OWPO is working to develop the Matching Grant Guidance, with awards anticipated in FY 2025. The Regulatory Improvement grant guidance will follow in FY 2025. OWPO will conduct Tribal consultation for the next phase of Tribal grants, with Phase 2 Tribal Grant Guidance and awards expected in FY 2024.

The benefits from funds distributed and the associated wells plugged, methane emissions reduced, and legacy pollution remediated under Bipartisan Infrastructure Law Section 40601 will continue to be built upon through 2030. As documented and undocumented orphaned well data is improved through the current and future efforts described in this report, the total number of orphaned wells in need of plugging and remediation nationwide will be better documented and inventoried. This will allow the Department to assess the ability of BIL Section 40601 funds to address the pervasive issue of orphaned oil and gas wells and identify what future solutions and funding may be required to continue mitigating the impacts of orphaned wells on public health and the environment.

Additional program information is available online and will be updated regularly at the [Department of the Interior's Orphaned Wells webpage](#).