

INTERNAL REVENUE SERVICE
NATIONAL OFFICE TECHNICAL ADVICE MEMORANDUM

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Director:

Taxpayer's Name:
Taxpayer's Address:

Taxpayer's Identification No
Year(s) Involved:
Date of Conference:

LEGEND:

Taxpayer =
Unit =
Location =
a =
b =
c =
Date 1 =
Date 2 =
Date 3 =
Date 4 =
Project Area =
Date 5 =
d =
e =
f =
g =

h =
 Date 6 =
i =
i =
k =
 Date 7 =
 State =
 Date 8 =
 Date 9 =
 Date 10 =
 Date 11 =
l =
m =
 Date 12 =
n =
o =
p =
q =
r =

ISSUE(S):

Whether the Taxpayer's post-1990 activities on its pre-1991 project area constitute a significant expansion of the project under Treasury Regulation § 1.43-2(d)(2).

CONCLUSION(S):

Because the Taxpayer has not established that it has increased its expected ultimate recovery due to the recovery of oil from substantially unaffected reservoir volume, the Taxpayer's post-1990 activities on its pre-1991 project area do not constitute a significant expansion of the project under Treasury Regulation § 1.43-2(d)(2).

FACTS:

The Taxpayer holds a working interest in, and operates the Unit. The Unit is an oil and gas producing field in Location, with a surface area of approximately a square miles. The reservoirs from which the oil and gas are produced have an average depth of b feet, and an average thickness of c feet. The field has been continuously producing since Date 1. The Unit was formed, and a waterflood project was implemented in Date 2. Taxpayer first considered implementing a carbon dioxide augmented waterflood (CO₂) tertiary recovery project on the Unit in Date 3, but did not because of the high cost and lack of a reliable source of CO₂.

In Date 4, a reliable source of CO₂ was obtained, and the Taxpayer constructed a CO₂ recycling plant at the Unit to maximize its use of the purchased CO₂. On or around Date 5, the Taxpayer submitted to the Service a self-certification, for purposes of the

Windfall Profits Tax, describing the Project Plan for a miscible CO₂ water alternating gas ("WAG") tertiary recovery project to be implemented on the Unit. A miscible WAG project involves first the injection of CO₂ which mixes with the oil to expand the oil's volume and reduce its viscosity, followed by the injection of water to sweep the oil and gas mixture towards the producing wells.

According to the self-certification, the Taxpayer intended to implement the miscible WAG project on the Project Area. The self-certification stated that a d% hydrocarbon pore volume ("HCPV") of CO₂ would be injected in the Project Area in a e:e WAG ratio. Each injection well would receive a f% HCPV "slug" of CO₂, which would be followed by an equal HCPV slug of water. The self-certification stated that this process was to be repeated g times. The minimum miscibility pressure to be obtained for the implementation of the project was h psi.

According to the self-certification, as of Date 6, the estimated total recoverable reserves of the Project Area were i stock tank barrels of oil ("STBO"). Of this, Taxpayer could recover j STBO without the miscible WAG project. The miscible WAG project would allow the Taxpayer to recover an additional k STBO. On Date 7, the Taxpayer filed an application with the relevant jurisdictional agencies for State, requesting that the agencies certify the project on the Project Area. The agencies certified the project prior to Date 8.

In Date 8, the Taxpayer began implementing the project on a portion of the Project Area. As of the end of 1990, the project was being implemented in accordance with the certification, namely that CO₂ was being injected in the Project Area in a e:e WAG ratio and that each injection well was receiving a f% HCPV slug of CO₂, which would be followed by an equal HCPV slug of water, with a target HCPV of d%. By the end of 1990, the Taxpayer's CO₂ recycling plant had reached its original planned capacity, and was undergoing an expansion to increase capacity.

In 1990, the Taxpayer formed a WAG management team, which was tasked with developing a methodology which optimized WAG ratios, determined the size of the CO₂ slugs, the timing of pattern abandonment, and determining expected performance. In Date 9, the WAG management team submitted a report discussing its conclusions and recommendations. On Date 10, the Taxpayer formed a conformance improvement team, which was tasked with determining which profile or sweep improvement methods could be applied economically on a scale which could significantly impact CO₂ recovery in the Unit and providing a resource base for conformance options and their applicability. On Date 11, the conformance improvement team submitted a report discussing its conclusions and recommendations.

Based on the reports submitted by the WAG management and conformance improvement teams, the Taxpayer made certain adjustments to the project as implemented prior to 1991. Taxpayer increased its target HCPV from d% to l% in some portions of the Project Area, and an overall average HCPV of m%. Taxpayer also

decreased the CO₂ and water slug sizes, varied its WAG ratio, and improved the placement of injectants by using polymer gel technology and drilling directional wells. On Date 12, one of Taxpayer's engineers drafted a memorandum discussing the expected impact of these changes. With the modifications to the project discussed above, the Taxpayer will be able to recover an additional n STBO from the Project Area after December 31, 1990. Of this expected recovery, o STBO would be attributable to injections made prior to 1991, and the remaining p STBO recovered would be attributable to the Taxpayer's activities after December 31, 1990. If the Project Plan, as implemented in Date 8, were continued for the expected life of the project, the project would recover q STBO from the Project Area. The modifications will result in an increased recovery of r STBO from the Project Area over the project as implemented. With respect to the activities at issue in this request, the taxpayer has not drilled new wells or perforated new intervals within the reservoir.

The Taxpayer has claimed credits under § 43 with respect to its post-1990 activities in its pre-1991 project area. The Taxpayer has also claimed credits under § 43 with respect to portions of the Unit which were not in the pre-1991 project area, which are not at issue in this request.

LAW AND REGULATIONS:

Section 43 provides an enhanced oil recovery credit in an amount equal to 15 percent of the taxpayer's qualified enhanced oil recovery costs for such taxable year. Section 43(c)(2) provides that the term "qualified enhanced oil recovery project" means any project-- (i) which involves the application (in accordance with sound engineering principles) of 1 or more tertiary recovery methods (as defined in § 193(b)(3)) which can reasonably be expected to result in more than an insignificant increase in the amount of crude oil which will ultimately be recovered, (ii) which is located within the United States (within the meaning of § 638(1)), and (iii) with respect to which the first injection of liquids, gases, or other matter commences after December 31, 1990.

A qualified EOR project must result in more than an insignificant increase in the amount of crude oil that ultimately will be recovered. Section 1.43-2(b) provides that all the facts and circumstances determine whether the application of a tertiary recovery method can reasonably be expected to result in more than an insignificant increase in the amount of crude oil that ultimately will be recovered. Certain information submitted as part of a project certification is relevant to this determination. See § 1.43-3(a)(3)(i)(D). In no event is the application of a recovery method that merely accelerates the recovery of crude oil considered an application of one or more qualified tertiary recovery methods that can reasonably be expected to result in more than an insignificant increase in the amount of crude oil that ultimately will be recovered.

Section 43 is available to a new qualified EOR project commenced after December 31, 1990. Section 43 was enacted as part of the Revenue Reconciliation Act of 1990, P.L. 101-508. Section 11511(d)(2) of the Act contained an exception to the December 31,

1990 requirement where a pre-existing project is significantly expanded. The Senate Finance Committee states that “a project will not be considered as substantially expanded to the extent it affects acreage to which an EOR method has previously been applied.” See 136 Cong. Rec. S15629 (October 18, 1990) *reprinted in* H.R. Rep. No. 101-37 (1990). However, the significant expansion provision was not included in § 43 as it was enacted.

Proposed regulations under § 43 were published on December 30, 1991. See 56 FR 67256. The proposed regulations, pursuant to the legislative history of § 43, contained an exception to § 43(c)(2)(A)(iii) for a significant expansion. In addition to the “unaffected acreage” language from the legislative history, the proposed regulations provided for significant expansions into a new reservoir and due to the termination of the pre-existing project. The preamble to the final regulations states that the comments received “suggest that in lieu of the requirement that a significant expansion must affect substantially unaffected acreage or a previously unaffected reservoir, a project should be considered significantly expanded if it affects previously unaffected reservoir volume. Commentators indicate that the term ‘reservoir volume’ more realistically reflects the three-dimensional concept petroleum engineers use in measuring reserves and the ultimate recovery of oil in place.” See TD 8448, 57 FR 54919.

Final regulations under § 43 were promulgated on November 23, 1992, reflecting the comments received. Section 1.43-2(d)(1) provides that if a project for which the first injection of liquids, gases, or other matter (within the meaning of § 43(c)(1)) occurred before January 1, 1991, is significantly expanded after December 31, 1990, the expansion is treated as a separate project for which the first injection of liquids, gases, or other matter occurs after December 31, 1990. Section 1.43-2(d)(2) provides that a project is considered significantly expanded if the injection of liquids, gases, or other matter after December 31, 1990, is reasonably expected to result in more than an insignificant increase in the amount of crude oil that ultimately will be recovered from reservoir volume that was substantially unaffected by the injection of liquids, gases, or other matter before January 1, 1991. In addition, § 1.43-2(d)(3) provides rules for a significant expansion due to the termination of the pre-existing project and § 1.43-2(d)(4) provides for a significant expansion due to a change in the tertiary recovery method.

Example (5) of Section 1.43-2(d)(5) illustrates the more intensive application of a tertiary recovery method. In 1989, F, the owner of an operating mineral interest in a property, undertook an immiscible carbon dioxide displacement enhanced oil recovery project. F began injecting carbon dioxide into the reservoir under immiscible conditions. The injection of carbon dioxide under immiscible conditions resulted in more than an insignificant increase in the ultimate recovery of crude oil from the property. F continues to inject the same amount of carbon dioxide into the reservoir until 1992, when new engineering studies indicate that an increase in the amount of carbon dioxide injected is reasonably expected to result in a more than insignificant increase in the amount of crude oil that would be recovered from the property as a result of the previous injection

of carbon dioxide. The increase in the amount of carbon dioxide injected affects the same reservoir volume that was affected by the previous injection of carbon dioxide. Because the additional carbon dioxide injected in 1992 does not affect reservoir volume that was substantially unaffected by the previous injection of carbon dioxide and the previous immiscible carbon dioxide displacement method was not terminated for more than 36 months before additional carbon dioxide was injected, the increase in the amount of carbon dioxide injected into the reservoir is not a significant expansion. Therefore, it is not a separate project for which the first injection of liquids, gases, or other matter occurs after December 31, 1990.

In summary, § 43 requires that a qualified EOR project can reasonably be expected to result in more than an insignificant increase in the amount of crude oil which will ultimately be recovered. Where an EOR project that was implemented before January 1, 1991 is significantly expanded, the expansion will be treated as a separate project. The significant expansion of an EOR project must reasonably be expected to result in more than an insignificant increase in the amount of crude oil which will ultimately be recovered in addition to the expected ultimate recovery of the pre-existing EOR project. The significant expansion at issue in this request requires a showing that the increase in the expected ultimate recovery will be recovered from reservoir volume that was substantially unaffected by the injection of liquids, gases, or other matter before January 1, 1991.

TAXPAYER'S POSITION:

The Taxpayer's theory of a significant expansion is based on a hypothetical termination of the EOR project commenced in Date 8. The Taxpayer defines "substantially unaffected reservoir volume" as any pore volume that has not been physically contacted or occupied by injectant as of December 31, 1990. Under this "snapshot" theory, any incremental oil which the taxpayer would not have recovered had the original EOR project been terminated on December 31, 1990, is necessarily from unaffected reservoir volume. Any injection after December 31, 1990 that leads to the recovery of incremental oil which would not have been recovered but for the post-1990 injections establishes that the pre-existing EOR project has been significantly expanded.

Further, the Taxpayer takes the position that it may demonstrate an increase in the expected ultimate recovery by comparing the amount of additional recovery over the intended life of the project with the additional recovery possible had the project been terminated on December 31, 1990. By this measure, taxpayers increase their expected ultimate recovery every day that they do not choose to terminate a project. In the alternative, the taxpayer argues that it may show an increase in the expected ultimate recovery by comparing the expected ultimate recovery of the project as implemented before 1991 with the expected ultimate recovery with the modifications made to the project after 1990.

ANALYSIS:

As an initial matter, it would appear that the taxpayer's activities, at best, fall squarely within the description of a more intensive application of a tertiary recovery method contained in Example (5) of § 1.43-2(d)(5). In both cases, the taxpayer is undertaking a CO₂ project, and alters the injection volume to improve performance. The Taxpayer's expansion theory is based on modifications, consistent with its original Project Plan, which reduce the individual WAG slug size, and result in an expected increase in target HCPV. While these modifications could be resulting in an additional 1 STBO, the facts of Example (5) also assume an increase in ultimate recovery. Example (5) shows a scenario where a taxpayer continues to operate a pre-1991 EOR project in the same reservoir volume with only modifications that are consistent with the original Project Plan. The phrase "more intensive application" is not limited to an increase in the volume of injectant used. While the size of individual injection cycles may be reduced, the overall amount of injectant can be increased by maintaining the injections over a longer period of time. Where, as here, a taxpayer accomplishes a more effective and efficient application of the tertiary method through a reduction of the volume injected, the taxpayer has nonetheless achieved a more intensive application of the method. Further, alterations to improve the efficiency of the project are routinely done by engineers throughout the life of an EOR project.

The Taxpayer takes the position that, unlike Example (5) of § 1.43-2(d)(5), the Taxpayer has significantly expanded the project to affect previously unaffected reservoir volume. The Taxpayer's theory of significant expansion is based on a "snapshot" of the project on January 1, 1991, as if there had been a hypothetical termination of the EOR project commenced in Date 8 on December 31, 1990. The Taxpayer's snapshot theory has no support in the regulations under § 43. The Taxpayer's definition of "substantially unaffected reservoir volume" is based on the incremental oil that would remain unrecovered had the original EOR project been terminated on December 31, 1990. The § 43 regulations provide separate rules governing a significant expansion due to an actual termination of the original EOR project. Section § 1.43-2(d)(3) allows a taxpayer that has terminated its EOR project for more than 36 months, or for less than 36 months with permission, to restart the pre-existing EOR project as a new project for purposes of § 43. In contrast, § 1.43-2(d)(2) assumes that the taxpayer will continue to operate the pre-existing nonqualifying EOR project in the affected reservoir volume, with the expansion treated as a separate EOR project. Section 1.43-2(d)(2) cannot be interpreted as allowing the mere continuation of the same EOR project to be considered a significant expansion, because § 1.43-2(d)(2) presupposes that the pre-existing project will continue parallel to the expansion. While the Taxpayer bases its position on § 1.43-2(d)(2), the Taxpayer seeks to apply the theory behind § 1.43-2(d)(3) to justify the continuation of the same project, essentially unchanged, without the need to have terminated its project as required by § 1.43-2(d)(3). Because § 1.43-2(d)(2) and § 1.43-

2(d)(3) operate as separate provisions, the Taxpayer may not selectively borrow from either to achieve the most advantageous result.

The Taxpayer's reading of the § 43 regulations would produce the absurd result of creating a rule for terminated projects that is appreciably more harsh than for a taxpayer who uses a hypothetical termination of the project as the basis of a significant expansion. The significant expansion exception should not be interpreted as creating a contradiction between § 1.43-2(d)(2) and § 1.43-2(d)(3). Further, the Taxpayer's reading of the regulations would rob § 43(c)(2)(A)(iii) of all meaning. The Taxpayer's interpretation would leave virtually no chance that a nonqualifying EOR project implemented before January 1, 1991 would fail to meet the significant expansion exception. The possibility is remote that the continuation of an ongoing EOR project will not result in the recovery of more oil than would have been recovered had the project been terminated on December 31, 1990. Given that there is no statutory provision for significant expansions, the statutory authority for the exception is very limited. Therefore, the regulation should not be interpreted, as the Taxpayer has, in such a way as to render § 43(c)(2)(A)(iii) meaningless. There is no indication that Congress would have intended such a result.

There is no guidance in § 1.43-2(d)(2) as to what is meant by the term "substantially unaffected reservoir volume." There is no provision in the statute which provides for a significant expansion of any kind, and therefore there is no definition of "substantially unaffected reservoir volume" contained in the Code. Under the legislative history of § 43, a significant expansion was to be treated as if it were a new project. As discussed above, the Senate Finance Committee states that "a project will not be considered as significantly expanded to the extent it affects acreage to which an EOR method has previously applied." See 136 Cong. Rec. S15629 (October 18, 1990) *reprinted in* H.R. Rep. No. 101-37 (1990). In finalizing § 1.43-2(d)(2), the Service felt that the acreage concept was too restrictive in that it did not allow for expansions in a vertical sense, leading to the reservoir volume language published in the final regulations. The reservoir volume language included in the final regulations allowed a taxpayer to receive the credit for undertaking new activities in a portion of the reservoir which would not have been reached by the pre-existing EOR project, without the taxpayer having to show that the project reached new acreage or a new reservoir.

In order to produce oil from a reservoir, the well bore must be open to the flow of oil from the reservoir rock. This is accomplished through the use of perforations in the well casing. Perforations are also the means by which liquids, gases, or other matter is injected into the reservoir in efforts to enhance oil recovery. Thus, the wells and their perforations are the means to access volumes of reservoir rock that are potentially affected by an EOR method. Essentially, between the injection wells and the producing wells lies the reservoir volume that is affected by the EOR project. In order to affect volumes of the reservoir unaffected by previous EOR efforts, we believe it obvious that, at the least, new wells or new perforations are required.

The legislative history and the preamble to the final regulations supports interpreting § 1.43-2(d)(2) such that a project will not be considered significantly expanded to the extent that it affects a reservoir volume to which an EOR method has been previously applied. As mentioned above, § 1.43-2(d)(2) assumes that the pre-existing EOR project will continue in the previously affected reservoir volume. As a result, to demonstrate a significant expansion into previously unaffected reservoir volume, a taxpayer must be able to demonstrate that it began injecting into new acreage, a new reservoir, or a new portion of the reservoir (such as a new interval or zone in the reservoir) into which it had not been injecting the tertiary injectant under the pre-existing EOR project. This can be demonstrated by a showing that new wells were drilled to new acreage, new reservoirs, or a new interval or zone in the reservoir, that perforations were made in new intervals of the reservoir, or that injections were made into pre-existing perforations which had never received injections prior to 1991. A taxpayer must also demonstrate that the first injection into these new portions of the reservoir was made after December 31, 1990.

Section 1.43-3 sets out the detailed information required for certification under § 1.43-3, necessary for demonstrating that an EOR project has been significantly expanded. Section 1.43-3(a)(3)(i)(D)(3) requires an adequate delineation of the reservoir, or portion of the reservoir, from which the ultimate recovery of crude oil is expected to be increased as a result of the implementation and operation of the project. Additionally, § 1.43-3(a)(3)(ii)(A) provides that if an expansion affects reservoir volume that was substantially unaffected by a previously implemented project, the taxpayer must provide an adequate delineation of the reservoir volume affected by the previously implemented project. Therefore, to certify that a project has been significantly expanded, a taxpayer must be able to compare the portion of the reservoir from which the increase in ultimate recovery is expected with the reservoir volume affected by the pre-existing EOR project.

Because a reservoir has a shape in three dimensions, an adequate delineation of necessity requires a three dimensional depiction of the portion to be affected. Delineation of a reservoir or portion thereof is virtually always accomplished through the use of specialized diagrams, such as contour maps, cross sections, or drawings using perspective in order to show the reservoir in three dimensions. While it is conceivable that this delineation can be accomplished by a detailed narrative description, this is rarely, if ever, done as a matter of industry practice. The use of these representational tools is universal in the oil industry, indeed their use is fundamental to the training of industry professionals at the most basic level.

Moreover, the oil industry well understands this type of “adequate delineation,” as a similar delineation was required for the administration of the Windfall Profit Tax of 1980. The Taxpayer submitted such representational tools in its original self-certification of the pre-existing EOR project under the Windfall Profit Tax. These tools were also used by taxpayers commenting on the proposed regulations under § 43. These comments provided the basis for the more liberal “substantially unaffected reservoir volume” rule of the final regulations which was substituted for the “acreage” rule of the proposed regulations.

The requirement of a three dimensional representation which compares the pre-existing EOR project area with the area in which the additional expansion project will be implemented reflects the assumption in § 1.43-2(d)(2) that the pre-existing EOR project will continue in addition to the expansion. As discussed above, the Taxpayer's claim of a significant expansion is based on a hypothetical termination of the process, rather than the legislative intent of the significant expansion exception. The Taxpayer's submission, including the Taxpayer's § 1.43-3 certification, does not provide a basis on which a determination that there has been a significant expansion into substantially unaffected reservoir volume can be made. Because technical advice has not been requested on the sufficiency of the Taxpayer's certification, no opinion is expressed here. However, the Taxpayer has not submitted an adequate delineation of the reservoir volumes affected by the pre-existing project and the claimed expansion, as required by § 1.43-3. The Taxpayer has not submitted the representational tools generally used for the delineation of the reservoir volume, nor has the Taxpayer submitted a detailed narrative containing the information which would have been provided by these tools.

The Taxpayer has shown that it continued the same project first implemented in Date 8. At no point was the project terminated. With respect to the activities subject to this request, the Taxpayer has continued its injections into the same reservoir volume and has not demonstrated that it has injected into a reservoir volume which had not received injections before December 31, 1990. Where the Taxpayer has injected into new portions of the reservoir, the Service has allowed the Taxpayer's credit, and those activities were not included in this request. The new activities which the Taxpayer points to as evidence of an expansion are intended to improve the efficiency and effectiveness of the pre-existing project, rather than reach new portions of the reservoir. The Taxpayer's modifications of its pre-existing project are consistent with its original Project Plan, and the Taxpayer has provided no evidence that the modifications required any new permitting.

Further, while the Taxpayer's definition of "unaffected reservoir volume" has no legal support, it also ignores the factual realities of its own EOR project. Under the Taxpayer's definition of unaffected reservoir volume, only that portion of the reservoir that has been actually swept by the injectant has been affected by the pre-existing EOR project. However, this theory is simply does not accurately represent the mechanics of the Taxpayer's miscible WAG method. As described above, under a miscible WAG project, the viscosity of the oil is reduced by CO₂, allowing the water drive mechanism to sweep the oil toward producing wells. The Taxpayer's theory does not take into account the effect of the drive mechanism on the entire Project Area. The Taxpayer's pre-existing EOR project would, by design, affect a much larger portion of the reservoir than that which was actually swept before January 1, 1991. If the reservoir volume already swept was the only portion of the reservoir affected by the project, the miscible WAG method would not function as described. Therefore, the Taxpayer's definition of "unaffected reservoir volume" is overly broad.

In conclusion, the Taxpayer has not shown that it has undertaken anything more than the continuation of the original EOR project, in the same reservoir volume, with the expected engineering modifications aimed at optimizing the project as originally implemented. Because taxpayer has not shown any activities beyond the modification of the amount of injectant injected into the same reservoir volume, it has not established that it has increased the expected ultimate recovery of the pre-existing EOR project through the recovery of oil from reservoir volume that was substantially unaffected by the injection of liquids, gases, or other matter before January 1, 1991. Further, the taxpayer has not terminated the pre-existing project or utilized a new EOR recovery method. Therefore, based on the foregoing, we conclude that the Taxpayer has not significantly expanded its pre-existing EOR project.

CAVEAT(S):

A copy of this technical advice memorandum is to be given to the taxpayer(s). Section 6110(k)(3) of the Code provides that it may not be used or cited as precedent.