

Bay Area Air Quality Management District

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Permit Evaluation and Statement of Basis for Major Facility Review Permit Reopening - Revision 3.0

for
**Chevron Products Company
Facility #A0010**

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May 2006

Application
12602

Application Engineer: Greg Solomon

Reopening of Title V permit for Chevron Statement of Basis

The District issued the initial Title V permit to this facility on December 1, 2003. The District issued a reopened permit, Revision 1, that amended flare and Regulation 9-10 requirements, corrected errors, and incorporated some new sources and permit conditions on December 16, 2004. EPA did not object to the issuance of that permit.

The District published another draft permit, Revision 2, for public comment on April 14, 2005. That draft permit addressed a number of issues raised by EPA in a letter dated October 8, 2004. (Note that EPA commented on five refineries in this letter. Not all comments concern this facility.) In addition, some issues raised in the refinery's appeal to the December 16, 2004 permit and some refinery comments on that permit were addressed. Revision 2 is being finalized in this action, together with Revision 3.

In response to petitions to reconsider its decision to not object to Revision 1, EPA issued an order on March 15, 2005. That order directed the District to reopen the permit to address possible deficiencies that EPA had identified based upon the petitions. This Revision 3, addresses the deficiencies identified in the March order that were not already addressed in Revision 2.

This statement of basis discusses the changes made by this reopening. It also provides additional analysis supporting certain applicability determinations. Where the additional analysis did not result in a permit change, the analysis is provided for information only.

This statement of basis does not address the factual and legal basis for any other permit terms. These are addressed in the comprehensive statements of basis that were prepared for the initial issuance of the permit and for the reopening issued on December 16, 2004. These are available on request.

Facility Description

The facility description can be found in the statement of basis that was prepared for the reopening issued on December 16, 2004. It is available on request from the Engineering Division of the District.

Changes to the Permit

The legal and factual basis for the permit follows. The permit sections are described in the order that they are presented in the permit.

Section II

S-4118, S-4119, and S-4127, are being added since these sources were either removed or re-permitted with other IC Engines.

S-7510, S-7520, S-7524, and S-7528 are being removed from the permit since the sources will be removed for the facility permit.

Several changes were made to Table II regarding the emergency standby engines. (see Complex Determinations below)

Sources S-4078, S-6054, and S-6055 Cooling Towers, are being removed from the permit per Chevron's request.

Section IV

Complex Applicability Determinations:

Basis for FCCU Feed Rate Limits and Mass Emission Limits for SO_x, NO_x, CO, and PM

The basis for Condition 11066 part 3 is being revised to "offsets exemption," which is a more accurate characterization of the justification for the condition. The basis for Condition 11066 part 2 will be changed to Regulation 2-1-301, which is a more accurate characterization of the justification for the feed rate condition.

Monitoring for BAAQMD Regulation 6, Sections 301 and 310 for emergency standby engines

EPA's March 15, 2005 order states, at pg.20:

"The District must reopen the Permit to include either periodic monitoring requirements to assure compliance with Regulations 6-301 and 6-310 for these twenty-four internal combustion engines or to provide adequate justification in the statement of basis explaining why no periodic monitoring is required."

Response:

Periodic monitoring is not appropriate for several reasons.

First, the potential to emit (PTE) for particulate for these engines is low, both singly and collectively. The following table shows the potential emissions using the factor of 0.0022 lb PM10/hp-hr for diesel engines derived from Chapter 3, Stationary Internal Combustion Engines, of AP-42, Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Area Sources, Fifth Edition. Each engine is conservatively assumed to operate for 500 hours, using the guidance in John Seitz' memo of September 6, 1995 entitled Calculating Potential to Emit (PTE) for Emergency Generators (attached), which states that "...500 hours is an appropriate default assumption for estimating the number of hours that an emergency generator could be expected to operate under worst-case conditions."

Source #	HP	lb/yr @ 500 hr/yr	tons/yr @ 500 hr/yr
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Source #	HP	lb/yr @ 500 hr/yr	tons/yr @ 500 hr/yr
7010	153	168	0.084
7501	538	592	0.296
7502	200	220	0.110
7503	200	220	0.110
7504	249	274	0.137
7505	75	83	0.041
7506	235	259	0.129
7507	398	438	0.219
7508	240	264	0.132
7509	240	264	0.132
7511	482	530	0.265
7512	269	296	0.148
7513	450	495	0.248
7514	450	495	0.248
7515	624	686	0.343
7516	624	686	0.343
7517	353	388	0.194
7518	353	388	0.194
7519	217	239	0.119
7521	435	479	0.239
7522	435	479	0.239
7523	435	479	0.239
7525	435	479	0.239
7526	435	479	0.239
7527	75	83	0.041
7529	75	83	0.041
7530	75	83	0.041
7531	370	407	0.204
Total			5.016

The emissions would likely be lower than the above estimates because engines in California generally use low-sulfur fuel containing less than 0.05% S, which lowers emissions below that assumed in AP-42.

Second, the engines are not subject to BAAQMD Regulation 6-301 (which prohibits excess of Ringelmann 1 for more than 3 minutes in any hour), but rather are subject to BAAQMD Regulation 6-303.1, which prohibits excess of Ringelmann 2 for more than 3 minutes in any hour. This standard is roughly equivalent to 40% opacity. The engines are not likely to exceed Ringelmann 2 at any time, particularly because they will use low-sulfur fuel containing less than 0.05% S.

Third, the grain loading is not likely to exceed the limit in BAAQMD Regulation 6-310.

Regulation 6-310 limits PM emissions to 0.15 gr/dscf. If it is assumed that the diesel engine exhaust gases contain 15% excess oxygen under normal operating conditions, the Regulation 6-310 limit can be compared to the AP-42 PM emission factor as follows:

From 40 CFR 60, Appendix A, Method 19, Table 19-1, a stoichiometric dry gas combustion factor of 9,190 dscf/MMBTU is given for distillate oil combustion. At 15% excess O₂ this factor becomes:

$$9,190 \times [21\% / (21\% - 15\%)] = 32,165 \text{ dscf (combustion products)/MMBTU}$$

The conversion of 0.15 gr/dscf @ 15% O₂ to lb/MMBTU is then:

$$(32,165 \text{ dscf/MMBTU}) \times (0.15 \text{ gr/dscf}) \times (\text{lb}/7,000 \text{ gr}) = 0.689 \text{ lb/MMBTU}$$

In the absence of actual emissions data for these engines, the District considers the AP-42 PM₁₀ emission factor for diesel IC engines to be representative, with a conservative margin of safety. From AP-42 Table 3.3-1, "Emission Factors For Uncontrolled Gasoline And Diesel Industrial Engines", the PM₁₀ emission factor (based on fuel consumption) is 0.31 lb/MMBTU. Since this assumed emission factor is well below the converted Regulation 6-310 emission rate, non-compliance is unlikely.

Fourth, the "CAPCOA/CARB/EPA Region IX Recommended Periodic Monitoring for Generally Applicable Grain Loading Standards in the SIP: Combustion Sources" dated July 2001 recommends that the only monitoring necessary for grain-loading for non-utility distillate-oil-fueled emergency piston-type IC engines is recordkeeping for fuel usage, which is already required for these engines. The permit is not reopened with regard to this issue.

Monitoring for BAAQMD Regulation 6, Sections 301 and 310 for S7010, Engine

S7010, Engine, received a District permit on March 4, 2003, pursuant to Application 6523 and was proposed in the Title V permit on April 14, 2005. This engine was subject to TBACT and therefore was designed to have a PM₁₀ emission rate of 0.2 grams per brake-hp hour, which is much lower than older engines. This emission rate is equivalent to 0.0004409 lb/brake-hp hour. This is one-fifth of the emissions of the older engines. Because the particulate emissions are so low, this engine is not expected to exceed the opacity limit in BAAQMD Regulation 6-301, to which it is subject since it is not an emergency engine, and the grain-loading limit in BAAQMD Regulation 6-310.

EPA also suggested that the engine horsepower ratings should be listed in Section II of the permit. The ratings will be added for all engines in this action.

Following is a discussion of minor corrections to the citations for these engines:

Since all of the engines over 50 horsepower (hp) at this facility except 7010 are emergency standby engines, all engines except 7010 are subject to BAAQMD Regulation 9, Rule 8, Sections 330 and 530. The rule was amended on August 2, 2001 to lower the

exemption limit to 50 hp. BAAQMD Regulation 2-1-114.2 was also amended on that date to require permits for all engines over 50 hp. Therefore, the following changes, shown in the permit in double-underline/double-strikeout, are proposed to be made to the citations of requirements.

Engines under 250 hp are proposed to be added to Table IV.A.2.1.

Regulations 9-8-330 and 9-8-530 are proposed to be added.

The exemption in Regulation 9-8-110.1 will be deleted because it is an exemption for requirements for gaseous-fueled engines and all of these engines are diesel fueled. Regulation 6-303.1 is proposed for addition to the citation of Regulation 6-303 because this is the section that applies to standby sources of motive power. BAAQMD Condition 20225, part 1, is proposed for deletion because it allows certain engines to run for 720 hours in non-emergency operation. BAAQMD Regulation 9-8-330 has superseded this condition.

Periodic monitoring for the grain loading standard in BAAQMD Regulation 6-310 for units fired on refinery fuel gas.

EPA's March 15, Order states, at p.19, that the District must re-analyze the determination of appropriate periodic monitoring for the grain loading standard for units fired on refinery fuel gas. The Order states that the District must either add monitoring to demonstrate compliance with the limit in BAAQMD Regulation 6-310, or explain why it is not appropriate.

Response:

The following explains why monitoring is not appropriate for combustion units firing refinery fuel gas (RFG).

The grain loading limit outlined in BAAQMD Regulation 6-310 is 0.15 gr/dscf. Based on the worst case assumption that all of the sulfur in the RFG combusted at the combustion units is emitted as PM emissions, the following emission calculations show that the PM emission rate of 0.15 gr/dscf will never be exceeded:

Based on a periodic sulfur tests performed on a number of samples, Chevron developed a multiplier factor to estimate the TRS in the RFG based on the H₂S content of the fuel. The tests demonstrate the TRS and total sulfur in the RFG to be one and the same. Based on a TRS multiplier of 1.2 and an average weighted concentration of 17.9 ppmv of H₂S in the RFG, the TRS/total sulfur concentration in the RFG at Chevron is 21.48 ppmv (~ 0.012 gr S/dscf)¹.

¹ (21.48 moles S/10E6 moles RFG) x (7000 gr S/1 lb S) x (lb-mol S/387 dscf) x (32 lb S/lb-mol S)
= 0.012 gr/dscf

Assuming the heating value of RFG is 1,100 BTU/dscf, the dry flue gas factor or F-factor² for RFG is approximately the same as natural gas i.e. 8,710 dscf/MMBTU, and that all of the sulfur is converted to sulfate (ammonium sulfate), the PM emissions exiting the combustion units at Chevron in the form of sulfate emissions is determined as follows:

$$\begin{aligned} &= (0.012 \text{ gr S /dscf RFG}) \times (\text{lb S}/7000 \text{ gr S}) \times (\text{dscf RFG}/1100 \text{ BTU}) \times \\ &(\text{MMBTU}/8710 \text{ dscf}) \times (10\text{E}6 \text{ BTU/MMBTU}) \times (\text{lb-mol S}/32 \text{ lb S}) \times \\ &(\text{lb-mol sulfate}/\text{lb-mol S}) \times (132 \text{ lb sulfate}/\text{lb-mol sulfate}) \\ &= 7.38\text{E-}7 \text{ lb sulfate/dscf} \end{aligned}$$

Converting the above mass emission rate from “pounds” of sulfate to “grains” of sulfate:

$$\begin{aligned} &= (7.38\text{E-}7 \text{ lb sulfate/dscf}) \times (7000 \text{ gr sulfate}/\text{lb sulfate}) \\ &= 0.005 \text{ gr sulfate/dscf} \end{aligned}$$

It can be seen from above that the PM emission rate in the form of sulfate emissions is well below the PM emission limit outlined in BAAQMD Regulation 6-310. Therefore, compliance can be assumed and no periodic monitoring is required at combustion units firing RFG. The permit is not reopened with regard to this issue.

Monitoring for Grain loading for Asphalt Operations

EPA requested that the district clarify the basis for its determination that periodic monitoring is not necessary to assure this source’s compliance with Regulation 6-310. When responding to earlier comments, the district had referred to the combustion of natural gas as the basis for its determination. The correct basis is the same as for the determination that monitoring for visible emissions is not justified: the control technology being used (mist eliminators) is expected to keep emissions below the standard with a wide margin of compliance. The district conducted a source test (ST-15) on A-37 and the average of the three runs was 0.021 gr/dscf, which is significantly less than 0.15 gr/dscf. Based on this source test result the district believes that no additional monitoring is warranted.

Exemption of Flares from Regulation 8

The Order for Chevron states that the Air District must either conduct a design review of the refinery flares to better demonstrate that the flares consistently meet a 90% control efficiency to qualify for the Regulation 8-1-110.3 exemption from Regulation 8-2 or include Regulation 8-2 as an applicable requirement for those sources. The Order further provides that the permit lacks periodic monitoring for compliance with permit conditions added to ensure that flares are properly operated. Neither of these changes is necessary.

In issuing the proposed permit, the Air District determined that on the basis of available information, refinery flares when properly operated easily meet a 90% reduction

² Based upon the assumption of complete stoichiometric combustion of natural gas (~ RFG). In effect, it is assumed that all excess air present before combustion is emitted in the exhaust gas stream.

efficiency. In response to concerns previously raised by EPA, the Air District added permit conditions to ensure the flares are operated in a manner consistent with the operational parameters assumed in determining that they qualify for the exemption. Because the permit conditions were not intended to ensure compliance with an applicable requirement, they should not have been identified as federally enforceable; the Air District will modify the permits to reflect this conclusion. For the same reason, periodic monitoring to ensure compliance with the permit conditions is not necessary.

In the Orders EPA provides no discussion of its apparent rejection of the explanations and supporting information previously submitted by the Air District in support of the permits as written. The Air District has explained that the design of the flares has been dictated by requirements of another agency charged with ensuring the protection of refinery workers and that a properly operating flare so designed will consistently meet the 90% reduction efficiency by a significant margin when operated properly. EPA's failure to address these points directly leaves the Air District in a difficult position in terms of responding to the Order.

Beyond these matters lie critical legal and practical matters that must be considered in determining whether the permits must be reopened to address these issues. First, the Air District's presentation of this issue to date has been incomplete. The Air District has reviewed the regulatory history of this provision and concludes that Regulation 8-2 was never intended to apply to refinery flares. Unfortunately, focus on the question whether refinery flares qualify for the Regulation 8-1-110.3 exemption has masked the more fundamental applicability issue.

Moreover, even if it is assumed that that flares are generally subject to Regulation 8-2, which would trigger an analysis of whether the flares qualify for an exemption under Regulation 8-1-110.2, the benefits of a design review are not apparent. EPA did not rely upon the studies referenced by the petitioners. It would be inappropriate to do so because the studies do not provide a basis for making conclusions regarding the performance of refinery flares. In fact, the Air District is not aware of any credible data that suggests a properly operating flare will not achieve combustion efficiencies significantly better than 90%; nor is it clear how a design review would address such issues if they existed.

The second matter of significant concern to the Air District is the effect of EPA's order on the Air District's efforts to develop a flare control rule. This rulemaking has been underway for more than two years and was adopted by the Air District Governing Board July 20, 2005. The course of this rulemaking has been arduous due to the complexities of regulating these sources, which are first and foremost safety devices used when there is a need to release refinery gases to avoid more serious consequences. While it is clear that minimizing the use of flares is possible, the mechanism for achieving this result has required careful crafting with a significant amount of industry and public input. The rule will be implemented by the development of Flare Minimization Plans over the following year. Requiring the Air District and the refineries to engage in competing exercises such as the design review called for by EPA is both unnecessary in this context and will detract from the effort of finalizing and implementing the flare control rule.

The adopted flare control rule will specify that flare operation is exempt from Air District Regulation 8 (and thus exempt from Regulation 8-2). This is consistent with the underlying logic of Regulation 8-2 as a requirement of general applicability intended to fill gaps until source-specific regulations are adopted. In the case of the flare control rule, it is not strictly necessary, given that flares have never been subject to Regulation 8-2. However, the Air District expects this will put to rest any uncertainty regarding applicability.

Monitoring for NSPS Subpart J at Flares

The following discussion regarding Subpart J was included in the Statement of Basis for proposed Revision 3. The discussion is being included in the final because the District is following through with deletion of Condition 18656, Part 7, and because this action is best understood in the broader context described below. In a July 10, 2006, letter to EPA, the District committed to propose incorporation of the H₂S standard of Subpart J as applicable to flares S-6015 and S6039. The statement of basis for that proposal will explain changes from the views stated below regarding the applicability of Subpart J.

The Order for Chevron states that the Air District must either impose the requirements contained in 40 CFR § 60.105(a)(3) or (4), or add monitoring to assure compliance with Chevron permit Condition 18656, Part 7 (referred to below as “prohibitory condition”). The Air District interprets the Order, in this respect, to assert the need for monitoring to determine whether the refineries are properly claiming that certain flares continue to be exempt from the H₂S standard of § 60.104(a)(1), i.e., that the flares are not used to combust gases on a “routine” basis. The Order does not assert that the exemption has been improperly claimed, but rather that Title V monitoring is required to verify on an ongoing basis whether the exemption is properly claimed. As explained below, the Air District in Revision 3 is proposing to delete the prohibitory conditions, and is otherwise deferring response on this issue until there is new guidance from EPA.

Regarding this issue, the order reflects views expressed in earlier comments from EPA. In an October 6, 2004, letter responding to these comments, the Air District affirmed the importance of determining applicability of Subpart J on a continuing basis but noted that, as a Title V matter, the imposition of monitoring is authorized only for requirements determined to be applicable. The Air District reasoned that therefore, to the extent a flare is, as a factual matter, exempt per § 60.104(a)(1), then the H₂S standard of Subpart J is not applicable and Title V monitoring is not authorized. The October 6 letter sought clarification from EPA on three points: 1) articulation of the broader Title V implementation principle being asserted by EPA, 2) the legal rationale for that principle, and 3) EPA’s plan for ensuring national consistency. To date, EPA has not addressed the first two points.

Concurrent with the March 15, 2005, Orders, EPA also issued guidance addressing the same issue. This guidance would have served to address the Air District’s concern regarding national consistency. However, on May 16, 2005, EPA issued a brief statement

withdrawing the March 15 guidance and stating that new guidance would be issued “in the upcoming weeks.” The Air District interprets this to mean either that EPA is reconsidering its position or, at the least, that the new guidance will serve to clarify EPA’s position and rationale. The Air District therefore believes the most efficient course is to defer its response to the Orders until new guidance is issued.

Regarding the prohibitory condition referred to above, the Air District is proposing deletion of this condition because it is neither required nor helpful. The Air District initially believed this condition might obviate the need to resolve the disagreement over monitoring for applicability of Subpart J described above. This belief has proven false. Judging from the March 15 Orders, the effect was merely to transpose the very same monitoring issue onto the new prohibitory conditions themselves. In general, there is no requirement in Title V or the implementing regulations to impose such prohibitions. Whether the exemption from the Subpart J H₂S standard has been properly claimed is determined based upon actual events at the refinery, not upon what the refinery is legally authorized to do. Consistent with this principle, if “routine” flaring does occur, then the flare is subject to the H₂S standard of Subpart J and the monitoring requirements of § 60.105(a) regardless of whether any such prohibition exists in the Title V permit. The prohibitory condition is simply redundant. Deletion of the condition should facilitate further discussions on this issue by returning the focus to the exemption language of Subpart J.

Cooling Tower Particulate Emissions

Chevron provided information regarding the Cooling Tower particulate emissions demonstrating that the emissions are less than 50% of the 40 pound per hour standard of Regulation 6-311. Chevron provided the recent maximum TDS and the circulation rates for the Cooling Towers. It was conservatively assumed that the drift rate is 0.02%. S-4172 has the highest emission rate.

$$55,000 \text{ gpm}(60 \text{ m/h})(8.34 \text{ \#/gal})(0.0002)(2790 \text{ ppm}/10^6) = 15.36 \text{ \#/h}$$

Other Issues

Table IV H.2.1 is corrected to show that Regulation 8-28-304 is federally enforceable.

Table IV H.2.1 is revised to include NSPS 60.484 since it will be removed from the permit shield.

In the original revision 3 proposal, a change to Table IV C.1.1 was proposed to include the cooling tower condition 22257. However, Chevron has since submitted data that demonstrates that the Cooling Towers will not require additional monitoring for Regulation 6-311. Condition 22257 will be removed from the permit.

Tables IV A.1.1 and E.2.1 are revised to include condition 22262 regarding visible emissions inspections.

Table IV A.4.1 is revised to remove S-7510, S-7520, S-7524, S-7528, S-7506, S-7519, and S-7529.

Table IV C.1.1 is revised to remove S-4078, S-6054, and S-6055 as requested by Chevron.

Table IV C.2.1 is revised for Condition 11066 part 4. The table incorrectly listed the SO₂ limit as 300 ppmv as opposed to 330 ppmv in the condition text.

Table IV G.1.4 is revised to add section 8-8-302.6 and 8-8-313 since these are applicable requirements that were inadvertently left out.

Table IV A.2.1 is revised to add clarification on 40 CFR Part 60 Subpart J section 60.104(a)(1) per EPA comment.

Section VI

The District is deleting of the portions of Condition 18656 (Parts 1 and 2) that were imposed to assure compliance with the exemption in Regulation 8-1. The District has determined that this regulation does not apply to flares. See the discussion above on Exemption of Flares from Regulation 8.

Condition 20225, part 1, is deleted because it allows certain engines to run for 720 hours in non-emergency operation. BAAQMD Regulation 9-8-330 has superseded this condition.

As recommended in EPA's comment, the requirements for visual inspections at the Cogeneration and Claus units will be clarified by adding the assumptions from the SOB to the permit. Specifically, visual inspections will be required at specified intervals based on the quantity of fuel combusted and monthly for the SRU's. Condition #22262, below, is being deleted.

Plant 10, sources 4350, 4352, 4227-9

1. The owner/operator of S-4350 and S-4352 shall conduct a visible emissions inspection after every 1 million gallons of diesel combusted, to be counted cumulatively over a five year period. If a visible emissions are detected, the owner/operator of S-4350 and S-4352 shall complete a method 9 evaluation within the 3 working days, or during the next scheduled operating period if the unit ceases firing on diesel fuel within the 3 working day time frame. (6-301)
2. The owner/operator of S-4227, S-4228, and S-4229 shall monitor and record on a monthly

basis the visible emissions from S-4227, S-4228, and S-4229 to demonstrate compliance with Regulation 6-301. These records shall be kept for a period of at least 5 years from the date of entry and shall be made available to district staff upon request. (6-301)

Condition 21232 for the NOx Box will be updated per Application 13570, which updated the NOx Box condition text to reflect the installation of new CEMs and more accurately show the NOx Boxes.

Section VII

Table VII A.3.3 now shows that the NH3 condition 16679 part 1 is not federally enforceable since it is a state-only requirement.

Table VII H.2.1 now shows that Regulation 8-28-304 is federally enforceable.

In the original revision 3 proposal, a change to Table VII C.1.1 was proposed to include the cooling tower condition 22257. However, Chevron has since submitted data that demonstrates that the Cooling Towers will not require additional monitoring for Regulation 6-311. Condition 22257 is being removed from the permit.

Tables VII A.1.1 and E.2.1 now include condition 22262 requiring visible emissions inspections. Table E.2.1 will also be changed to have consistency with regard to monitoring for 6-310.

Table VII A.2.1 is revised to delete the requirements of Conditions 18656 Parts 1 and 2, and the monitoring requirements associated with 40 CFR 60.18(c)(3).

Table VII A.4.1 is revised to remove S-7510, S-7520, S-7524, S-7528, S-7506, S-7519, and S-7529.

Table VII C.1.1 is revised to remove S-4078, S-6054, and S-6055 as requested by Chevron.

Table VII G.1.4 is revised to add section 8-8-302.6 since this is an applicable monitoring requirement that was inadvertently left out.

Section IX

Section 60.484 is no longer the subject of a permit shield.

Tables IX B1, B2, and B3 are revised to show the subsumed section for 8-5-501 will be removed and sections 60.115b(a) and 60.115b(b) is subsumed into 63.654(h). Also

section 60.116 is removed from the shield since the sections are listed in the appropriate tables. Tables IX B1, B4, and B5 are removed.