

**DEP Permit # E23-524**  
**DEP Permit HDD Reference # PA-DE-0046.0000-RD**  
**DEP HDD # S3-0591**  
**Township – Middletown**  
**County - Delaware**  
**HDD Site Name – Valley Road Crossing**

**1st Public Comment Period**

<b>Commentator ID #</b>	<b>Name and Address</b>	<b>Affiliation</b>
1	Marion Yaglinski Media, PA	
2	Gene Lo Conte	
3	Raymond Weinmann 327 Forge Road Glen Mills, PA 19342	
4	Rosemary and Gordon Fuller 226 Valley Road Media, PA 19063	
5	Ira Dunoff 1005 Birchwood Lane Glen Mills, PA 19342	
6	Beth and Frank Revenis 157 Valley Road Media, PA 19063	
7	Jane McBride Glen Mills, PA	
8	Melissa Marshall, Esq. P.O. Box 408 1414-B Indian Creek Valley Road Melcroft, PA 15462	Mountain Watershed Association
9	Aaron J. Stemplewicz, Esq. 925 Canal Street 7 <sup>th</sup> Floor, Suite 3 Bristol, PA 19007	Delaware Riverkeeper Network
10	Joseph Otis Minott, Esq. 135 South 19 <sup>th</sup> Street, Suite 300 Philadelphia, PA 19103	Clean Air Council
11	Alexander G. Bomstein, Esq. 135 South 19 <sup>th</sup> Street, Suite 300 Philadelphia, PA 19103	Clean Air Council
12	Kathryn L. Urbanowicz, Esq. 135 South 19 <sup>th</sup> Street, Suite 300 Philadelphia, PA 19103	Clean Air Council
13	George Alexander Media, PA	

**1. Comment**

I am outraged that these two hazardous liquids pipelines were allowed in a highly populated area close to schools, businesses and in the backyards of homes. Everyone living in the explosion/blast zones of these pipelines are in danger. This project should NEVER have been approved. It needs to be shut down permanently. Sunoco has the WORST safety record in the industry. It is a morally bankrupt company that puts its own profit above the residents of PA. (1)

**2. Comment**

I support Mariner 2 east. These people who object are just mis informed and bored. (2)

**3. Comment**

My family lives in a home located at 327 Forge Road in Glen Mills, Pennsylvania.

We, and every neighbor I speak to, strongly disagree with this project. The dishonest manner in which the project was revealed to the public is striking. I won't get into that.

My dire concern is the clear and omnipresent danger this pipeline would pose to our community. We can all agree there is an existing pipeline in our community that has operated safely. However, the M2E pipeline is different. It brings to our community a unique catastrophic risk due to the enhanced pressure of this line. The thought that anyone could unknowingly ignite a vapor cloud at any time, is horrifying. With this pipeline, ETP/Sunoco has essentially usurped the safety and well-being of Pennsylvania's citizens. When deciding live here, we did not agree to this risk.

Finally, the pipeline runs beneath a popular youth soccer facility in the Sleighton Park. One mile away from this park there is a large quarry operation that regularly detonates explosives to produced crushed stone product. Homes a mile away, like ours, feel our homes shake whenever the detonation occurs. I have read that these blast-induced seismic wave transmission stresses can be cushioned by back-fill soil in the case of trenched pipe. However, this is not the case with pipe that is laboriously bored in place. Nobody from ETP/Sunoco can guarantee the safety of this project. Money is money. Lives are lives. Please do what is right and mothball this time-bomb. Accountability must start now. (3)

**4. Comment**

We are submitting these questions and comments, as requested, in response to the January 24, 2018 correspondence received from Sunoco Pipeline L.P., regarding the proposed horizontal directional drilling (HDD) required to advance their Mariner East 2 Pipeline Project. Please note that we are submitting these comments as laypeople, unfamiliar with the technical terms, details and scientific/engineering knowledge required for a project of this scale and complexity – as used in the report – and as homeowners whose private well is located within 150-200 feet (not the 490 feet as specified in the report) of the proposed drilling area based upon the engineering plans provided. On the Well Location Map our well is marked as WL-08102017-604-01

and from the scale of the map can be seen to be approximately 150 feet from the proposed HDD. We measured this ourselves to confirm the mistake by Sunoco. Additionally, our son has T1D (Type 1 diabetes) which, unlike type 2 diabetes (a metabolic disorder), is an incurable, life-threatening auto-immune disease. This results in him having a weakened immune system, making the supply of fresh, clean, potable water necessary to his continued health and wellbeing.

As mentioned previously, our private well is located approximately 150 feet from the proposed pipeline not 490 feet as incorrectly stated on the Well Location Map in the report. For the public record please note that our well is 150 feet deep with the pump set at 100 feet, according to our well company, Powell Pump and Well Drilling of Aston, Pa. Based upon our interpretation of the proposed engineering drawings, our well and pump is within the drilling zone. This clearly causes us some concern when reviewing the discussion regarding inadvertent returns (or IR's as identified by Sunoco) regarding groundwater management. My review of the geological information provided concludes that our groundwater is likely originating from within the "fractures and joints that provide secondary porosity in bedrock". The report mentions that the potential exists that "turbid water ... or dilute drilling fluids" may be "discharged to the waters of the Commonwealth" and that Sunoco DOES anticipate that "HDD activities could affect individual well use during active drilling for wells located within 150 linear feet" of the HDD, which would include OUR private well.

Additionally, the information provided by Sunoco indicated that "drilling fluids under pressure migrated into open fractures at depth within bedrock and traveled to the surface" ... and "these discharges, if large enough, can affect the local water table and possibly affect domestic water supply yields".

Our concerns are further confirmed by the development of a "contingency plan" to address these potential technical issues. Given this technical information we must conclude that this drilling WILL affect the quality and potentially quantity of water within our private well. This begs the question regarding what safeguards will be employed to protect the quality of our private well and resulting groundwater? Additionally, what recourse does my family have WHEN, not IF the quality of my water is impacted by this drilling program, based upon our interpretation of the information provided? That is not specified or clearly stated within this Sunoco Report.

The document further mentions establishing "a communication and response plan to respond to complaints from well owners during HDD activities upon confirmation of any impact from drilling operations and provide alternative water supplies where needed (page 10, point 2). Isn't this like the proverbial closing of the stable door after the horse has bolted? As mentioned previously, our son has a weakened immune system and cannot tolerate any potential contamination or reduction of quality to our water. Additionally, it is not clear what constitutes "alternative water supply" and how this would impact our quality of life, let alone our property value. Please define the State's approach to this process, understanding that our interpretation of the proposed plan is that any water quality impacts will be mitigated or addressed after

they have been identified. We are formally noting on the record that a plastic tank or bottled water is NOT acceptable to us given our concern for the health and wellbeing of our son.

Although not germane to this technical discussion, it is not clear what legal recourse we have should this drilling activity impact our well. We understand that our well is likely constructed within some type of fractured rock. The Sunoco document mentions the use of drilling fluids and grout which, it appears to us as laymen, are designed to be injected into the rock to impede any lost water, which, in our minds, could dry within the fractures providing water to our well, potentially affecting the quantity and quality of water that is provided by our well.

It is also not clear what health risk is associated with this drilling process, let alone the material that may be transported within and through the pipelines. We have seen news reports from other areas where there have been fires, explosions and other issues associated with this drilling methodology and gas/oil transport. We would like to understand what safety measures are being employed to protect the health and safety of our family and neighbors, as that is not clearly stated or discussed. (4)  
Letter – [Rosemary and Gordon Fuller](#)

## **5. Comment**

In addition to the certified first-class letter we sent you on February 1, 2018, we would also like to email you our questions and comments, as requested, in response to the January 24, 2018 correspondence received from Sunoco Pipeline L.P., regarding the proposed horizontal directional drilling (HDD) required to advance their Mariner East 2 Pipeline Project. As you may be aware, Sunoco has filed revised construction plans for two stretches of the Dragonpipe (Mariner East 2) and there is a public comment period ending on February 6, 2018. One of the two stretches with revised construction plans is in Chester County and the other is in Delaware County, along Valley Road, south of Sleighton Park, which is where we live (No. 226).

Please note that we are submitting these comments as laypeople, unfamiliar with the technical terms, details and scientific/engineering knowledge required for a project of this scale and complexity – as used in the report – and as homeowners whose private well is located within 150-200 feet (not the 490 feet as specified in the report) of the proposed drilling area based upon the engineering plans provided. On the Well Location Map our well is marked as WL-08102017-604-01 and from the scale of the map can be seen to be approximately 150 feet from the proposed HDD. We measured this ourselves to confirm the mistake by Sunoco. Additionally, our son has T1D (Type 1 diabetes) which, unlike type 2 diabetes (a metabolic disorder), is an incurable, life-threatening auto-immune disease. This results in him having a weakened immune system, making the supply of fresh, clean, potable water necessary to his continued health and wellbeing.

There are several things that we find troubling about these plans, but we are most perturbed by the cavalier attitude that Sunoco are taking toward local wells and aquifers.

As mentioned previously, our private well is located approximately 150 feet from the proposed pipeline not 490 feet as incorrectly stated on the Well Location Map in the report. This alone highlights Sunoco's failure to accurately record private well details and is, in itself, an indication of the lack of attention that has gone into these plans. For the public record please note that our well is 150 feet deep with the pump set at 100 feet, according to our well company, Powell Pump and Well Drilling of Aston, Pa. Based upon our interpretation of the proposed engineering drawings, our well and pump is within the drilling zone. This clearly causes us some concern when reviewing the discussion regarding inadvertent returns (or IR's as identified by Sunoco) regarding groundwater management. My review of the geological information provided concludes that our groundwater is likely originating from within the "fractures and joints that provide secondary porosity in bedrock". The report mentions that the potential exists that "turbid water ... or dilute drilling fluids" may be "discharged to the waters of the Commonwealth" and that Sunoco DOES anticipate that "HDD activities could affect individual well use during active drilling for wells located within 150 linear feet" of the HDD, which would include OUR private well.

Additionally, the information provided by Sunoco indicated that "drilling fluids under pressure migrated into open fractures at depth within bedrock and traveled to the surface" ... and "these discharges, if large enough, can affect the local water table and possibly affect domestic water supply yields".

These issues above can produce two kinds of problems. First, our wells can be completely drained, just as they were at the Shoen Road site in Chester County and the Tunbridge site in Delaware County. Secondly, as the water from the aquifer drains out from the drill hole, it could pour into the Rocky Run wetlands, carrying contaminants with it.

Sunoco does not properly address either of these issues. Our concerns are further confirmed by the development of a "contingency plan" to address these potential technical issues. Given this technical information we must conclude that this drilling WILL affect the quality and potentially quantity of water within our private well. This begs the question regarding what safeguards will be employed to protect the quality of our private well and resulting groundwater? Additionally, what recourse does my family have WHEN, not IF the quality of my water is impacted by this drilling program, based upon our interpretation of the information provided? That is not specified or clearly stated within this Sunoco Report.

The document further mentions establishing "a communication and response plan to respond to complaints from well owners during HDD activities upon confirmation of any impact from drilling operations and provide alternative water supplies where needed (page 10, point 2). Isn't this like the proverbial closing of the stable door after the horse has bolted? As mentioned previously, our son has a weakened immune system and cannot tolerate any potential contamination or reduction of quality to our water. Additionally, it is not clear what constitutes "alternative water supply" and how this would impact our quality of life, let alone our property value. Please define the State's approach to this process, understanding that our interpretation of the

proposed plan is that any water quality impacts will be mitigated or addressed after they have been identified. We are formally noting on the record that a plastic tank or bottled water is NOT acceptable to us given our concern for the health and wellbeing of our son.

Although not germane to this technical discussion, it is not clear what legal recourse we have should this drilling activity impact our well. We understand that our well is likely constructed within some type of fractured rock. The Sunoco document mentions the use of drilling fluids and grout which, it appears to us as laymen, are designed to be injected into the rock to impede any lost water, which, in our minds, could dry within the fractures providing water to our well, potentially affecting the quantity and quality of water that is provided by our well.

It is also not clear what health risk is associated with this drilling process, let alone the material that may be transported within and through the pipelines. We have seen news reports from other areas where there have been fires, explosions and other issues associated with this drilling methodology and gas/oil transport. We would like to understand what safety measures are being employed to protect the health and safety of our family and neighbors, as that is not clearly stated or discussed.

Last but not least, Sunoco was required by its August 9 settlement agreement to consider alternative routes for this pipeline. This is a legal commitment. In every report so far, including these two for the Chester County and Delaware County stretches, Sunoco dismisses the possibility of other routes by stating they are “not practicable” without supplying evidence of any serious alternative consideration.

We respectfully request serious consideration of our concerns and await your response to our comments. (4)

## **6. Comment**

I am writing to express my concerns about the horizontal directional drill (HDD) installation of a 16-inch and 20-inch diameter pipelines associated with the Mariner II pipeline project.

I live within 450 ft. of proposed HDD activity along Valley road in Delaware Country. With no other source of water, I rely solely on the availability of a clean, potable and dependable water supply from my well. There seems to be a high risk for disruption of clean, potable, and dependable water due to well and aquifer damage as a result of drilling vibration, fractures in the bedrock system, inadvertent returns and losses of returns. All of which have occurred at other HDD sites across the state. Once disturbed, contaminated, or drained, these water systems cannot be repaired or replaced. These events can have an immediate and significant impact to me and the other residents who rely on these water systems. There is also the bigger picture impact to streams, wetlands and local wildlife that part of that ecosystem.

As stewards of our local environment and natural resources I implore you to consider the risks the Mariner II pipeline HDD installation creates and the irrevocable impact

of those risks and to stop the use of HDD techniques along this highly populated and fragile route. (5)

## 7. **Comment**

Our family resides at 157 Valley Road this is within 450 feet of the ME2 pipeline. We did receive both the certified and first class duplicate of the reevaluation report. We have several comments and questions about this report.

A little about our family, which I feel is a moot point to the EPA, however, I feel the need to introduce us. My husband Frank and myself both 50 years old children Daughter 21 years old Early childhood education major at University of Pittsburgh and twins age 15 freshman at Penncrest High school. I am a graduate of Widener University my husband is Self-employed in the Alarm Services industry. Upon opening the packet, it is overwhelming. Without a geology degree, or a friend in the EPA this report is Not User Friendly and incomprehensible to the common citizen.

If you are to look and please, We Would Greatly Appreciate it if you could, explain to us how the EPA has in any way helped prevent soil contamination, and a total change to the shape of the landscape to the open space wetlands. Which by the way are NOT in the documents? This area may very well be where the water perks into the land and feeds the water supply from which our water originates. Our home is located within a softball throw of Geotech SB-05. Which Sunoco purchased from the resident about 1/2 acreage of the property is currently a wooden parking lot made of OIL and Chemical Soaked wood ties. All of the precipitation that has and will fall perks through this and becomes drinking water for someone inner neighborhood or becomes water in the creek. This property which drains downhill into the Rocky Run Creek is barely being helped by the blue and orange run-off tubes. Which by the way when the Tree Eating Machines invaded the area to create this showed NO Regard whatsoever of the dripping oil and waste the machines discharge and leak. The OLD GROWTH TREE LOSS is irreparable.

We understand that Sunoco now owns this property however if the manner in which they installed this drilling site, trenched the pipes through the wetlands is any indication of the way they will safely drill. OH, MY GOODNESS!!!!

1. How are you going to help us if OUR WATER is NOT POTABLE?????
2. What exactly will the EPA do to protect us?
3. What are the long term plans the EPA has to ensure the safety of the residents that boarder the pipeline?

The change in depth of the drilling and angles which the drilling is now changed to prevent the back flow of "drilling lubricants" What is the chemical composition of the lubricant that will eventually make there way through the fracture system of the rock bed from which our DRINKING WATER flows?

In NO WAY has there been ANY transparency to the public.

There was an EPA representative at the end of our driveway within the past month to "clean up " the drill site access Sunoco has created.

We would have really appreciated a knock at the door and a simple this is who I am and do you have any questions I may be able to answer if not, someone will get back with you.

We would greatly appreciate hearing how remediation of the effects of this pipeline installation can be obtained and whom will be the responsible party. If anyone at the EPA is able to respond to our questions and or could entertain a neighborhood question answer session we would be most appreciative. (6)

#### **8. Comment**

I am very worried about the mariner east drilling and the constant accidents. please be careful of our property and well-water supplies. we are not connected to public water and there are no water connections available in our section of Edgmont Township.

Please make sure Sunoco is taking every precaution. (7)

#### **9. Comment**

Pursuant to the Corrected Stipulated Order entered on EHB Docket No. 2017-009-L on August 10, 2017 ("Order"), and on behalf of Clean Air Council, Mountain Watershed Association, Inc., and the Delaware Riverkeeper Network ("Appellants"), please accept these comments on Sunoco Pipeline L.P.'s ("Sunoco") re-evaluation report ("Report") for the horizontal directional drilling ("HDD") indicated by drawing numbers HDD PA-DE-0046.0000-RD & PA-DE- 0046.0000-RD-16 (the "Site").

#### **The Department's Review**

Pennsylvanians rely on the Department of Environmental Protection to protect them from dangerous activities that threaten their air, water, land, and health. The Department has recognized that the construction of Mariner East 2 has done damage to the public already. The purpose of Sunoco's re-evaluations of certain HDD sites is to do a better job avoiding harm to the public and the environment in its HDD construction. The Department's role is to review and assess Sunoco's Report before deciding what action to take on it.

It is the Department's duty to review and assess the Report with the goal of protecting the public and the environment placed first and foremost. Looking at the individual circumstances at the site in question is key. Critically important is accounting for input from those who live nearby, who have a deeper connection with—and greater knowledge about—the land than the foreign company building the pipelines through it.

A meaningful, objective and substantive review and assessment by the Department will ensure that new or further HDD operations at the re-evaluated sites will cause minimal, if any, harm to the public and the environment. Anything less than a full, careful, and objective review would endanger the public and the environment.

Pennsylvanians place their trust in the Department to do a thorough, science-based assessment -- taking into account these and other comments-- and to approve Sunoco's recommendation only if it would protect the public and the environment from any further harm.

### **Comments on HDD DE-0046.0000-RD & PA-DE-0046.0000-RD-16**

#### **1. The risks to water supplies have not been adequately addressed.**

As a threshold matter, Sunoco has not finished collecting data on well locations and features; it should not be permitted to proceed with its plans until this information is collected and analyzed. Sunoco explains that through contact with nearby landowners, it identified 28 parcels that rely on private water supplies and confirmed 36 parcels are served by public water. Based on the numbers Sunoco has provided, that leaves 19 landowners unaccounted for within 450 of the HDD alignment. Even for the wells Sunoco believes it has identified, Appellants are concerned that Sunoco has not properly documented the limited information it has. As a landowner pointed out in her own comment, The Water Supply Illustration in Attachment 2 seems to indicate a distance between her well (WL-0810201-604-01) and the alignment that is far greater than the actual distance. It is important the information Sunoco relies on is accurately reflects in its Report and analysis. Per the Order, Sunoco must also identify well production zones for all wells. It has not done so.

In its discussion of risks to water wells, Sunoco explains that drilling may “result in transport of diluted drilling fluids towards the withdrawn zone for individual wells.” Sunoco also incredibly claims that, “[w]hile this does not present a health hazard, it can be an aesthetic issue for users and could affect taste.” This sweeping claim is false. Bacterial contamination is known to result from drilling fluids or other sediment in drinking water. Water contamination from Sunoco's HDD has already caused bacterial contamination in wells of residents in Exton, PA and in Berks County near the Joanna Road HDD Site.

Also concerning is that Sunoco seems to have arbitrarily limited the zone of impact, stating “HDD activities could affect individual well use during active drilling for wells located within 150 linear ft.” This distance is unsupported by data and requires justification. Wells situated further from HDD alignments have been contaminated across the state as a result of drilling.

Despite the admitted risks to water supplies, Sunoco does not intend to change its plans to avoid well contamination, but rather will “encourage landowners to make advance arrangements for the supply of alternative water sources as necessary during the HDDs.” Residents nearby Sunoco's operations should not bear the burden of dealing with the consequences resulting from illegal conduct such as Sunoco's pollution of their wells. They are innocent bystanders. The Department has a legal obligation to not permit illegal pollution such as water well contamination, and may not approve construction techniques that are likely to result in such contamination.

## **2. Sunoco’s plans do not account for the challenges associated with drilling through the heterogeneous rock found at the Site.**

The Site is underlain by Baltimore Gneiss. As Sunoco’s hydrogeologists have described in the reevaluation of the Arch Bishop/South Chester Road crossing: “To date, steering within the Baltimore Gneiss has been problematic and revised plans for the HDD should take steering issues into consideration, especially if intersect drills are considered.” Here, an intersect drill is not planned, but that alone does not negate the steering problems associated with drilling through this type of rock. Sunoco’s hydrogeologists previously made four recommendations to address these concerns:

The only practical solutions for optimizing progress and staying on alignment may be to govern drilling rates and continue to use greater than typical alignment checks to maintain alignment. In addition, consideration should be given to lowering bit pressures, as well as mud pressures. Higher bit pressures can cause undo wear on and slow overall advancement of the HDD. Diamond bits may be beneficial for maintaining the cutting surface and steering through hard rock zones.

Sunoco ignored these recommendations and upon resubmitting the re-evaluation report for the Arch Bishop/South Chester Road site, inexplicably deleted the recommendations of its scientists.

In this Report, Sunoco has noted but has not ultimately addressed the challenges of drilling through Baltimore Gneiss, and given previous concerns, Sunoco should be required to do so or to explain how those concerns do not apply here. This analysis should come from Sunoco’s hydrogeologist and should also address whether the recommendations referenced above – or some other means of mitigation – are appropriate for the Site.

Finally, besides Sunoco being unable to stay on alignment when drilling in Baltimore Gneiss, it appears drilling through this rock may have contributed to previous IRs on both Mariner East I and Mariner East II. In the Hydrogeological Evaluation Report, Sunoco’s scientists note: “The only IR for ME I that occurred in Delaware County was at ME I HDD 24 near Edgemont PA, approximately two miles northwest of HDD S3-0591 in Baltimore Gneiss.” Similarly, in regard to ME II, Sunoco’s scientists explain “a few HDD alignments in similar metamorphic bedrock environments have experienced IR events. In Delaware County, four HDDs locations have experienced IRs.” This too should be addressed, along with what specific measures are being taken to avoid similar problems at the Site.

## **3. Sunoco must provide a site-specific plan for managing disrupted groundwater.**

As with previous sites, the difference in elevation at the Site may result in the disruption of groundwater that would ultimately need to be managed at the surface. In the Hydrogeological Evaluation Report, Sunoco’s scientists recommend preparing a contingency plan for dealing with groundwater flow back. Appellants agree with this

recommendation and believe a site- specific contingency plan and updated E&S plans – as the Department has required for other sites – is also needed here.

The Hydrogeological Evaluation Report also notes that similar groundwater discharge has happened at other sites in Delaware County, and “[t]hese discharges, if large enough, can affect the local water table and possibly affect domestic water supply yields.” This risk needs be discussed further, and measures must be taken to avoid wells running dry.

Although RQD values for the two most recent geotechnical borings for HDD S3-0591 are relatively high, variability in RQD values and five fracture trace intersections are indicative of weaker bedrock zones that may represent preferred pathways for drilling fluids, under pressure, to migrate. A fracture trace intersection was mapped on the southern part of the HDDs, which may represent a zone of less competent bedrock. The overburden soils in the vicinity of HDD S3-0591 are comprised of highly weathered bedrock which has relatively low cohesive strength and can be up to 39 feet thick. As such, there is an increased risk of IRs in these horizons during entry and exit for these drills.

## **Conclusion**

For these reasons, Appellants request that the Department not approve the HDD re-evaluation recommendation without first (1) requiring that Sunoco gather the needed missing information, as outlined above, and (2) determining that, in light of the newly gathered information, HDD as suggested is appropriate at the HDD Site.

Thank you for considering these comments. Please keep us apprised of your next steps on this HDD Site. (8-12)

Letter – [Clean Air Council – 2-6-18 – Valley Road Crossing](#)

## **10. Comment**

This is a comment on Sunoco’s new HDD plans for Valley Road, Delaware County.

1. There are many wells in this area, and because one end of the alignment is so low, there is likely to be a major problem with produced water, wells running dry, and aquifers being damaged. Sunoco fails to adequately address this issue. How many times will Sunoco be allowed to repeat the problems that occurred at Shoen Road and Tunbridge Apartments? Every time Sunoco drills into a hillside, it drains an aquifer. Is the DEP giving Sunoco a license to do whatever it wants to aquifers?
2. Sunoco is required to consider alternative routes, and I see no evidence that it actually did so. In this particular case, there is an important wetland at the southern end of the alignment. Other routes could avoid this wetland. The DEP should insist that Sunoco seriously consider alternatives.

The DEP needs to hold Sunoco accountable for doing what it promised in the August 9 settlement. (13)