TECTONIC AND GEOLOGICAL STRUCTURES OF GUNUNG KROMONG, WEST JAVA, INDONESIA

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ABSTRACT: The Gunung Kromong complex is a solitary hill which physiographically located within the Jakarta Coastal Plain Zone. The research is mainly formed of primary data from observations and measurements of all geological elements especially morphological aspects and geological structures to reveal the tectonic background and its relation to the oil seepage. Sedimentary rocks outcrops appear in the western part around the cement plant surrounded by well exposed of igneous rocks. Oil seepage, gas and hot springs are found in limestone which has high fracture intensity and at low elevation. The distribution of sedimentary rocks is not only controlled by the folds and fault structures but also influenced by the igneous rock intrusion. The alignment of the structure in West Palimanan is formed by steep slopes on dacite igneous rock which is concluded as fault scarp. There are found abundance of fault indications in the form of slickenside, fault breccias, millonites, drag folds and have high intensity of shear joint. The KRG-7, KRG-8 and KRG-9 observation points, a slickenside with the same plane was found but has different slicken line, each shows a thrust fault and normal faults. The direction of slickenside divided into 4 units of fault groups. The series of hills in the south of the Baribis Fault occur because of the lifting through the fold and the thrust faults mechanism. The thrust fault in the Gunung Kromong complex is the hanging wall section of the Baribis thrust fault, so that it belongs to the leading thrust system.

Keywords: Kromong, Fault, Slickenside, Structure

1. INTRODUCTION

The Gunung Kromong complex is a solitary hill which physiographically located within the Jakarta Coastal Plain Zone. The morphology is very contrast with the surrounding that is flat. The rocks in the Gunung Kromong complex are dominated by Plio-Plistocene volcanic / intrusive rocks and a few others are composed by Upper Neogene marine sedimentary rocks. These sedimentary rocks consist of limestone units equivalent to the Middle Miocene-Parigi Formation, and claystone units from the Middle-Upper Pliocene Kaliwangu Formation.

The distribution of rocks in the Gunung Kromong complex is isolated to the morphology of the circular hilly complex. This hilly complex is similar to Mount Muria in Central Java which is believed as back arc or back arc vocanism [1]. The distribution of rocks ends in the plain morphology, which is covered by surface deposits, especially alluvium. At the southern part of Gunung Kromong complex, another volcanic/ intrusion rock complex is also thought to be of the same age, but its physiographically counted as the Bogor Zone, located on the slopes of the active Gunung Ciremai (Fig.1) with elevations more than 200 m above sea level [2,3].

The geology of Gunung Kromong complex is very distinctively different from its surroundings, even though a part of same tectonic environment, which is morphologically forming a solitary



Fig.1 Geological Complex of Gunung Kromong combined with DEM (Modification) [2,3]

All rocks in the Gunung Kromong complex have been deformed strongly, characterized by the abundance of fault indications found in the form of slickenside, milonites, fault breccias, drag folds and have high stacking fault density. High density fracture of rock at this location, as one of the causes of oil seepage and hot springs. Many other areas around Gunung Kromong which have high structural density, had no indication of oil seepage.

The structural pattern in the Kromong area is part of regional tectonic products in West Java. Its position is relatively close to the Baribis Fault as a regional thrust fault that lifts Neogene-aged marine sediments to the surface [4]. Van Bemmelen [5] and Martodjojo [6] stated that the Baribis Fault did not cross the Palimanan area (Gunung Kromong Complex). The Baribis Fault is a part of fold structure pattern that causes all Paleogen-Neogen sedimentary rocks in West Java spread generally in east-west direction. In the Kromong area the distribution of marine sedimentary rocks is relatively different, circular following the intrusion of the body.

Is the geological process in the Gunung Kromong area purely due to tectonics or are there other geological processes? Is the Baribis Fault passes through Gunung Kromong? Why oil seepage is only found in the Kromong area? While in surrounding areas which have the same structural density the oil seepage is nowhere to be found. This study aims to reveal the tectonic background of the Gunung Kromong complex and its relationship to the baribis fault and the presence of oil seepage based on field observation data and all geological elements, especially aspects of morphology and structural geology.

2. METHODOLOGY

This research is mainly formed from observations and measurements of all geological elements, especially morphological aspects and geological structures. Some observational paths are carried out with a measure section, especially at the boundaries of rock units and several locations that have high fracture density. The identification of geological structures is determined from various aspects, such as the lineament interpretation of topographic maps and DEM; morphological observations in the field; measurement of geological structures element; and the interpretations of the strike dip. Fracture measurements are carried out using the window scan and scan line method, especially in the outcrop around the oil seepage site. Geological structure data processing using Wintensor and Dip software, to determine the orientation of the structure and the stress system.

3. RESULT

The result of observation data and measurement of all geological elements in Gunung Kromong are divided into several part, namely Stratigraphy, Geological Structure, and Geological Structure Analysis.

3.1 Stratigraphy

Almost of all the exposed rockon Gunung Kromong located at the mine site. The best outcrops of sedimentary rocks are revealing in the western part which is around the cement plant of PT. Indocement Tbk (KRG-1 to KRG-27) (Fig.2). While almost all location of igneous rocks was well exposed, including in the areas of East Palimanan, West Palimanan, Bobos and Galuh District (KRG-1 to KRG-34; LWG-1). Oil seepage, gas and hot springs are found near the cement factory area. There are five adjacent oil seepage sites, namely Oil-1 to Oil 5, three of which are in man-made wells with a depth of less than 0.5 meters. At the same location, hot springs also come out with temperatures around 30° to 40° even in some places accompanied by gas bubbles. All of these located in the Kromong limestone unit. The largest hot springs discovered at the cement factory complex with a much higher temperature above 50°.



Fig.2 Most of the observation point located in the western part of Gunung Kromong (Location: West Kromong Area, next to the PT. Indocement Tbk)

The oldest rock units exposed at Gunung Kromong are limestone dominated by boundstone to grainstone and small amount of wackestone to mudstone (KRG-5 to KRG-17). Boundstone and grainstone are thick and unlayered, hard, whitish-gray, with many coral fossils. Boundstone facies are mostly exposed in the mining area of PT. Indocement. Wackestone to mudstone is found in small quantities and generally interspersed with clastic sediments in the form of mollusk clay. This limestone which generally layered well with thickness ranging from a few cm (2cm-5cm) until approximately 1.5 m, is generally easy to be incised, gray to beige, some are chalky, and some layers contain mollusk shells. The position of trace fossil is generally horizontal to the plane of rock layers, with sedimentary structures

including parallel lamination and cross bedding.

In some places, limestone is found interspersed with shaly claystone and non-calcareous sandstones, so it is believed that there is the influenced from clastic sediments from land or back reefs. Rudstone is generally formed in the fore reef, but since it is local and found in small numbers at this location, so it is concluded as a back reef. The Kromong limestone is equivalent to the Mid-Miocene Parigi Formation which bordered by shaly claystone unit from Pliocene Kaliwangu Formation. There are limestone interspersed with non-calcareous siliciclastic sedimentary rocks, indicating claystone units at this location are interfingering with Kromong limestone which are not a part of the Kaliwangu Formation.

Not far from the location of KRG-1 and KRG 17, in river valleys that flow in the morphology of the plain, mudstone outcrops which generally poorly layered have been found. These clay stones are blackish gray, shaly and some layers contain fossil mollusks. No contact with limestone units was found but based on the strikedip position of the rock layers, it is known that the rock is younger than the Gunung Kromong limestone and can be equated to the Kaliwangu Formation. This formation is generally revealed far from the location of Gunung Kromong which occupies the morphology of the plain to bumpy plain. Outcrops of the Kaliwangu Formation are relatively rare, since the position of the rock layer is relatively horizontal and mostly covered by surface deposits in the form of younger lava deposits from Ciremai Mountain and river alluvium.

Traces of the baking effect on the carbonate clay layer have been found near KRG-15. The limestone unit of Gunung Kromong is intruded by igneous rock intrusion composed of dacite to andesite. This igneous rock has light gray color to weathered gray, hard, generally porphyritic, vesicular and generally has sheeting joint. Each intrusion cone forms a solitary hill and generally conical with a steep slope. There are no signs of mineralization or altered rocks, so it can be concluded that all formed at the same age. Since in some locations the slope is steep and forms a topographic alignment, it is believed that the intrusion has been faulted.

3.2 Geological Structure

The geological structures interpretation through topographic maps and DEM, found number of a topographic alignments interpreted as a fault structure. Based on those structural alignments, direct observations in the field were made that found some fault indications. The geological structure in West Palimanan is dominated by horizontal faults with the main direction north-south (NS), southwest-northeast (SW-NE) and northwest-southeast (NW-SE) (Fig.3).

The alignment of the structure in West Palimanan is formed by steep slopes on daciteigneous rock

which is concluded as fault scarp. The alignment of this structure extends along approximately 700m in the east-west direction, in which are found abundance of fault indications in the form of slickenside, fault breccias, millonites, drag folds and have high intensity of shear joint. Fault scarp on the dacite body N290°E/ 80°, limiting the distribution of dacites with carbonate rocks and claystone units. The fault area is parallel to the sedimentary rock layers (Fig.4). The following are explanations for each aspect:



Fig.3 The geological structure in West Palimanan



Fig.4 Fault scarp on the dacite body (Location: west side of PT.Indocement Tbk. Area)

3.2.1 Slickenside

Slickenside were found at KGR-2, KRG-8, KRG-9, KRG-24, KRG-27, KRG-31 and KRG-32; fault breccia and millonite found at KRG-3, KRG-5, KRG-7, KRG-9, KRG-24, KRG-27; drag folds are located KRG-27, KRG-9, while high-intensity shear joint found at KRG-3, KRG-5, KRG-7. Slickenside was found with a size of more than 1m², so it was concluded as a main fault or as a first order fault (KRG-03, KRG-08, KRG-24, KRG-27, KRG-32 and KRG-38). Slickenside generally parallel and cut at an

angle of about 45° to the direction of the fault line. At the KRG-7, KRG-8 and KRG-9 observation points, a slickenside with the same plane was found but has different slicken line, each shows a thrust fault and normal faults. The upright fold structure accompanied by an upright fault and a horizontal fault as a tear fault which causing many drag fold is found as a hint of strong deformation (Figs.5,6 and Table 1).



Fig.5 Reconstruction of geological structures along the north-south cross-section (Fig.2)

Slickenside data processing shows slickenside rosette diagram is dominated by west-east direction with a parallel position towards the strike/dip and fault line. Based on Moody and Hill [7] concept, this direction is concluded as a thrust fault. The combined slickenside stereogram shows the oblique slip, which tends to be horizontal (Fig.6).

CODE	STRIKE /DIP	РІТСН	ТҮРЕ
KRG-2	240/65	25 NE	Thrust Sinistral Fault
KRG-8	50/25	45 NE	Thrust Sinistral Fault
	125/60	30 SE	Thrust Sinistral Fault
KRG-24	25/60	25 NE	Normal Sinistral Fault
	340/90	10 S	Normal Sinistral Fault
	300/60	10 NW	Thrust Dextral Fault
	25/88	4 N	Thrust Sinistral Fault
	350/75	86 N	Normal Sinistral Fault
KRG-27	170/75	47 N	Normal Dextral Fault
	275/75	75 E	Normal Sinistral Fault
KRG-31	290/65	30 SE	Thrust Sinistral Fault
	280/90	45 E	Thrust Sinistral Fault
	255/90	80 E	Normal Dextral Fault
KRG-32	235/90	60 E	Normal Dextral Fault
	250/70	80 E	Normal Dextral Fault
	260/80	45 E	Thrust Sinistral Fault
	110/65	65 SW	Thrust Sinistral Fault
	310/85	80 NW	Thrust Sinistral Fault
	140/55	45 NW	Thrust Sinistral Fault
BA 24	93/74	40	Normal Sinistral Fault
	165/78	85	Thrust Fault
	135/75	85	Thrust Fault

CODE	STRIKE /DIP	PITCH	TYPE
	270/52	30	Normal Dextral Fault
BA 45	227/87	43	Thrust Sinistral Fault
	316/26	85	Thrust Sinistral Fault



Fig.6 A) Slickenside rosette diagram; B) The combined slickenside stereogram (Note: combined data of various orders within one tectonic period)

Based on the direction it is divided into 4 units of fault groups, namely east-west, northwest-southeast, northeast-southwest and north-south. Associated with the Moody and Hill [7] concept and the regional structural patterns in West Java, the Northeast-Southwest group is concluded as a conjugate fault.

The slickenside with the east-west fault pattern is relatively parallel to the fault line as well as to the strike direction (Fig.7). Sense of movement fault consists of a sinistral thrust fault (3 units), normal dextral (3 units) and normal sinistral (2 units). Associated with other field data and Moody and Hill [7], a slickenside with a type of thrust fault is formed along with the folding of sedimentary rocks. Based on the fold geometry which tend to be asymmetrical, the fault structure is formed after strong folded rock, so it classified as fold propagation fault.

The fold axis which is parallel to the thrust fault shows the type of thrust fold belt structure. Even more if it is associated with regional tectonics in Java then it is included in the first order structure which associated with compressional tectonics.

Slickenside with normal fault is also included as the main fault but formed post-compressional. This fault is the result of equilibrium (release) when the compression stress begins to decrease. From the slickenside data, it is categorized as normal sinistral and dextral normal with opposite plane position, so it can be concluded as conjugate normal fault.



Fig.7 The west-east slickenside is parallel to the strike/dip of the rock layers and the fault scarp lineament (Combined station data from Fig.2 based on the same rosette direction)

This slickenside with northwest-southeast (NW-SE) and northeast-southwest (NE-SW) fault patterns group has a pitch between 4 to 85 and based on the sense of movement consisting of a thrust fault, horizontal fault, normal fault and oblique. Slickenside of the northwest-southeast fault with 45° angle to the strike and fault lineament (Fig.8). Based on the stress system and Moody and Hill concept classified as the horizontal fault group [7].



Fig.8 Slickenside of the northwest-southeast fault (Combined station data from Fig.2 based on the same rosette direction)

The results of data processing show the position of the main stress is $N35^{\circ} E / 22^{\circ}$, which means it is still related to compressional stress that tends to form a horizontal thrust fault or thrust horizontal fault (transpressional). According to the Moody and Hill [7] concept, this fault group belongs to first order which causes the formation of drag folds. In this slickenside group, there is also a high pitch with a normal fault movement.

The data shows that the reactivity of the fault which was originally transpressional changed to a normal fault due to the equilibrium force (release fault) or formed together with the compression force as the anthitetic normal fault of the transpressional fault.

The slickenside with north-south (N-S) fault patterns is dominated by transpessional oblique faults with thrust sinistral movement (Fig.9). Normal sinistral develops in the lower order as equilibrium when compression occurs in the transpressional system.



Fig.9 The north-south slickenside, dominated by a thrust sinistral fault, shows the effect of compressional stress on lateral displacement (transpressional) (Combined station data from Fig.2 based on the same rosette direction)

3.2.2 Fault breccia and millonite

Sometimes it is difficult to distinguish the cesarean breccia from the coherent dacite / stratified dacite breccia in the field. Both types is not layered and have the same matrix as the components. Generally, the fault breccia is found together with milonite as a fine powder of material which crushed on the surface of slickenside and located in the high crack zone (damage fracture). Along the alignment of the structure (KGR-5 to KGR-17; KRG-32), fault breccias are found in hard rocks, such as dacite, limestone, volcanic breccia, and the sandstone layer. Dozens of fault outcrops found at this location show that outcrops are a part of the core of the main fault zone (Fig.10).



Fig.10 Fault breccias are commonly found together with a slickenside, and in several locations accompanied by millonite (Location KRG-32)

3.2.3 Joint structure

Joint structures develop both in sedimentary and igneous rocks. In igneous rocks, there are two types of joint, primary joint which forms simultaneously with freezing magma and the secondary joint due to tectonics. Primary joints are commonly found as sheeting joints and some are columnar joints [8]. On this joint structure, almost all the surface of the intrusion is scattered with igneous rocks (Fig.11).



Fig.11 Primary joint (non-tectonic) in dacite igneous rock (Location KRG-34): A. Dacite as coherent dacite facies; B. banded facies show a layered impression (sheeting joint or columnar joint) [8]

Tectonic joints are found in both rocks in sedimentary and igneous rocks. Joint structures in sedimentary rocks are found in tightly folded rock layers (tight faults) as cleavages or located in fault zones. In strong folded sedimentary rocks, the intensity of the joint structure is high and generally known as a shear joint. Tectonic joints in igneous rocks are characterized by the formation of slickenside and fault breccias as found in the KRG-8 outcrop (Fig.12).

Systematic and non-systematic joints with high frequency sandstone layers in carbonate rock intercalation as a clue the core zone of the fault line found in KRG-3 and KRG-4. High-intensity tectonic joints on dacite rocks, followed by the formation of fault breccia and slickenside showing their position at the core fault in KRG-8 (Fig.12). The existence of alignment of the fault plane in igneous and sedimentary rocks in adjacent locations shows that tectonic compression continues at the age of Plio-Plistocene.



Fig.12 A) Systematic and non-systematic joints with high frequency sandstone layers in carbonate rock; B) High-intensity tectonic joints on dacite rocks

3.2.4 Parasitic fold

At the bottom of the fault scrap, carbonate rocks interlocked with claystone units consisting of the dominance of shale clays with tufaceous sandstone inserts, conglomerate sandstones, calcareous sandstones, and calcarenite limestone lenses exposed.

Interfingering of ductile and brittle (inhomogeneity) rock clusters cause small folds to form in the claystone (parasitic fold) As an indication of compressional tectonics which causes a shift in the plane between the rock layers (Fig.13).



Fig.13 Inhomogeneity of rocks causing parasitic faults in the claystone layer (Location KRG-25)

Each type has different engineering properties, causing ductile rocks as in claystone to siltstone which more easily folded, while brittle rocks such as breccias, sandstones or carbonate rocks break more easily. By observing the shape of the parasitic fold, the nature of the shift between the fields of the rock layer can be known which is formed under the compression stress system. This conclusion is also strengthened by high dip layers ranging from 75° to 80° .

3.2.5 Drag fold

Drag folds are found in KRG-1, KRG-27, KRG-31 and KRG-33, as an indication that this area is located within the enlargement zone. It's generally found together or nearby slickenside or fault breccia, so its formation is related to compressional tectonics. This statement is also supported by the discovery of parasitic fold and shear properties in claystones that resemble scally clay.

Drag folds are also identified through interpretation of the pattern of the strike in which many fold structures are found with large folded wing angles. With considered to the dimensions and axis of the north-south trending fold, it can be concluded that the structure of this small fold is a drag fold that is related to a horizontal fault (Fig.14).

Based on pattern of the strike, there are many small fold structures with north-south trending with high wing folds (above 40° to 90°), it is concluded as a drag fold mainly by horizontal fault (Fig. 14).



Fig.14 The geometry of the folds and their position on the fault structure

3.2.6 Fold structure

The strike of sedimentary rock layers in the Kromong area are varied but is still predominantly by east-west (W-E) (Figs.15,16). This position still in line with the general pattern of regional structures in West Java as a first-order of Java step fold pattern. Other fold structures are north-south (N-S), southwest-northeast (SW-NE) and northwest - southeast (NW-SE), all of which are second-order folds. From the strike pattern reconstruction of West Palimanan (Fig.14), the second order fold structure is a drag fold caused by the fault structure, especially horizontal fault. On the outcrop scale, the sample of folding structure was found at the KRG-25.



Qa: Alluvium Qvy: Volcanic breccia and Tuff

Fig.15 Map of the structure and distribution of rocks in the Kromong area. The structure of the fold with various strikes shows the influence of horizontal fault, igneous rock intrusion and the sloping dip factor (open fold)



Fig.16 Strike of rock layers around the Gunung Kromong complex, dominated by the west-east direction as first order. The second order formed by the influence of fault and intrusion of igneous rocks - dacite.

The measurements in the field shows that the dip of the rock layer also varies from 4° to 90° . The closer to the intrusion, the more the dip of the rock layer is getting above 40° up until vertical (KGR-1 to KGR 17) in contrast to the more distant mean the more near the dip to horizontal (4°). In the field, a high dip is found along with the discovery of a slickenside, fault breccias and located within high fault intensity.

The structure of tight folds is formed by tectonic compression and is associated with thrust faults. Layer with high dip are located near the intrusion body, so its formation is also influenced by the magmatism / volcanism activity when magma breaks through the side rocks to the surface.

The high dip layer belongs to the tight fold whose formation is associated with the thrust fault. Based on the geometry aspects of the folds which tend to be asymmetric, the fold structure is formed first followed by thrust fault (fold propagation fault). This condition caused by the influence of the igneous rock intrusion, also due to the fault process especially thrust faults.

4.4 Geological Structure Analysis

Based on surface geology data and seismic interpretation, the Baribis Fault is the regional northern most thrust fault on Java Island. In the Pantura area (Jakarta Coastal Plain Zone) to below the surface of the Java Sea, large scale thrust faults is unfound in the Java Sea or in the foreland basin. The data shows that compression stress at the location has been reduced or lost causing the position of the sedimentary rock layer is relatively horizontal or bending. The geological structure of the Palogen-Neogene sedimentary rocks is generally relatively simple, because they are generally formed due to the influence of old faults shifting process in the basement rocks which are reactivated by younger tectonics (basement involved).

The Baribis Fault as the main thrust fault, not only bounding the morphology of the hills (Bogor zone) with Jakarta Coastal Plain Zone but also separating the buckling and the bending zone. The series of hills in the south of the Baribis Fault occur because of the lifting through the fold and the thrust faults mechanism. This event was also followed by magmatism activity which eventually accelerated the lifting process. The whole tectonic and magmatism process forms a series of hills called the orogenic pathway.

The orogenic pathway located above the continental plate and parallel to subduction zone which currently set in the south of Java Island [9]. The boundary between the hills (topographic front) with the plain situate around the Gunung Kromong complex. Not far to its northern part is Baribis Fault as the main thrust fault with the status as Wedge top separating the orogenic wedge segment with the foreland basin (Fig.17).

In the study area, the Baribis Fault is located at the northern part of Gunung romong thrust fault which has smaller dimensions. The thrust fault in the Gunung Kromong complex is the hanging wall section of the Baribis thrust fault, so that it belongs to the leading thrust system (Fig.18). Its position is parallel with the slope of the fault plane tilted to the south, so that the thrust fault complex is part of Java thrust fault belt. This type of structure is more effective in lifting older rock up to the surface compared to the trailing thrust system [10]. Leading thrust system causes the southern part of the Baribis Fault have a high topography that exposes old rocks to the surface.

The steps folding structure type as happened in the Gunung Kromong complex always followed by the formation of local horizontal faults often called tear faults (Fig.14). Because of their small size, tear faults generally do not significantly affect the regional morphology. The steps folding structure generally only develops on sedimentary rocks (non-basement infold or thin skin tectonic). This fold pattern generally asymmetrical followed by thrust faults with sloping angles until the basement surface. The steps folding structure can also form a duplex pattern when the fault lines intersect each other (Fig.17).



Fig.17 Gunung Kromong's tectonic environment over the orogenetic pathway with the foreland basin [9]



Fig. 18 Gunung Kromong's leading thrust system

Far from the intrusion complex, the slope of the sedimentary rock layer is increasingly sloping to an average below 20° with various dip directions. In general, the structure of the folds is weakly wavy forming an open fold structure. The sedimentary rocks distribution in the Gunung Kromong area is relatively circular following the boundaries of the Gunung Kromong intrusion complex, so it resembles a dome structure. The data shows that the distribution of sedimentary rocks is not only controlled by the folds and fault structures but also influenced by the igneous rock intrusion.

Oil seepage appears through fault in limestone at a low altitude. In other low altitude areas with same

high structural density, there is no oil seepage was found because it was covered by claystone from the Kaliwangu formation with impermeable properties.

4. **DISCUSSION**

The Kromong area (Palimanan) is located on the boundary between the physiography of Jakarta Coastal Plain Zone and the Bogor Zone, which morphologically steep hills to gently sloping. The boundaries between those physiography in West Java is the Baribis thrust fault. Although Van Bemmelen [5] and Martodjojo [6] stated that the Baribis Fault did not cross the Gunung Kromong Complex, but the ground facts prove that tectonic compression is still found in this area. This compression path continues into the East Java region through the Kendeng area up until NTB and NTT, so it is called the Baribis-Kendeng Fault [11]. Based on the stratigraphy in the Baribis fault zone, which faulted Kaliwangu Formation and Citalang Formation which are in the Late Neogene age, it can be concluded that this compression tectonic occured at the time of Plio-Plistocene. The strong compression tectonic causes sedimentary rocks in this location to be strongly deformed, causing many cracks both as joint structures and fault structures. This crack zone as a pathway of oil seepage from the subsurface to the surface. Further research needs to be done whether the source rock really comes from under the Gunung Kromong or far from somewhere else.

5. CONCLUSION

Based on data, it can be proven that tectonic compression is still found in this area at the age of Plio-Plistocene. The Gunung Kromong is an area that bounded the morphology of the hills (Bogor Zone) with Jakarta Coastal Plain Zone but also separating the buckling zone and bending zone, where the Baribis fault is also as the second boundary of the zone. The series of hills in the south of the Baribis Fault occur because of the lifting through the fold and the thrust faults mechanism. The thrust fault complex is part of Java thrust fault belt. Oil seepage appears through cracks in limestone at low elevation, and in the surrounding area covered by claystone from Kaliwangu formation.

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