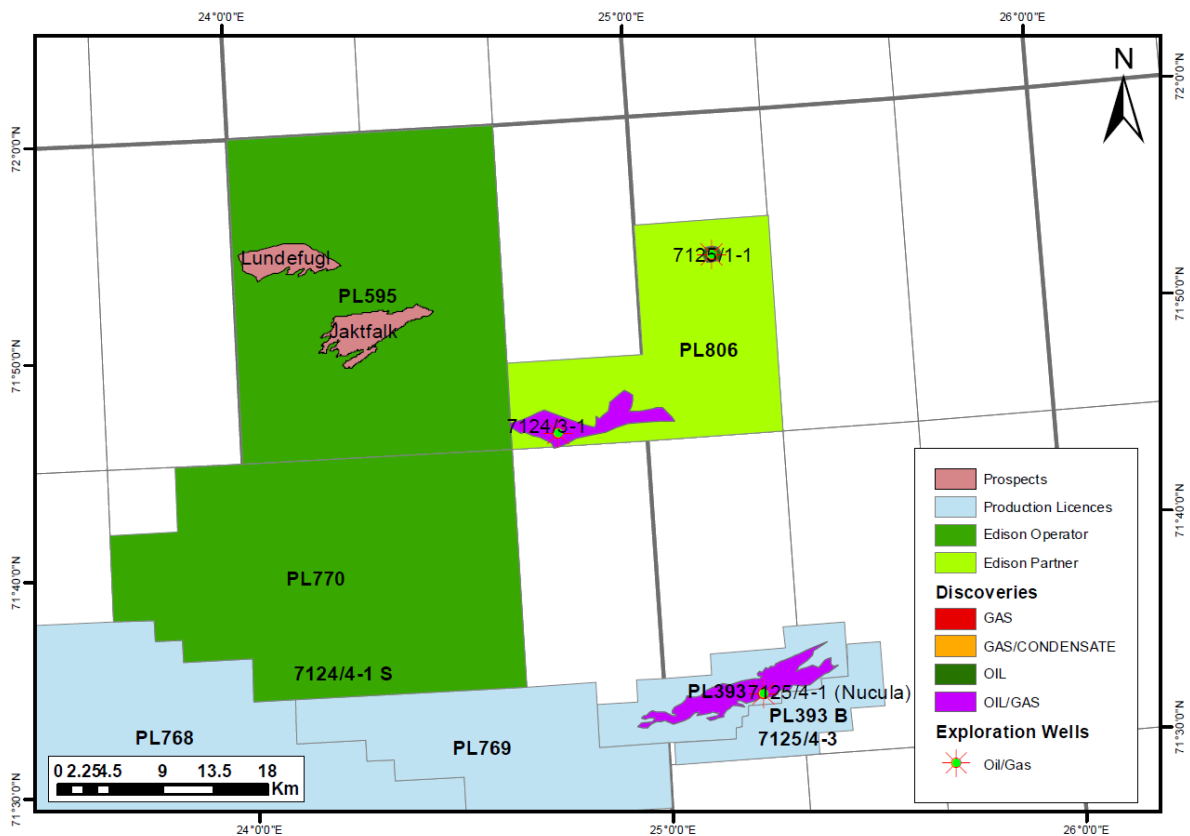


PL595

Relinquishment Report

March 2014



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1. License History

1.1 Executive summary

PL 595 (fig. 1.1) is located in the Barents Sea, close to the Nyslepp Fault complex which, lies in the transition zone between Nordkapp and Hammerfest Basin (see fig. 1.2). This is an area close to several discoveries such as the 7124/3-1 (Bamse) and 7125/1-1 (Binne) to the east, 7125/4-1 (Nucula) discovery to the SE and the 7122/6-1 (Tornerose) discovery to the west.

The main plays in the licence area are the tilted fault blocks and horst traps containing Jurassic reservoir sands of the Kapp Toscana Group, sourced and sealed by the shales of the Upper Jurassic to Lower Cretaceous Adventdalen Group. Additional targets are the Triassic Fruholmen and Snadd formations. The main risk in the area is related to retention and/or charge which are suggested to be the cause of the under-filled discoveries nearby. It is likely that hydrocarbons may have been lost from the traps due to tilting, fault leakage triggered by Tertiary-Quaternary exhumation and re-migration. Another risk is related to the reservoir presence.

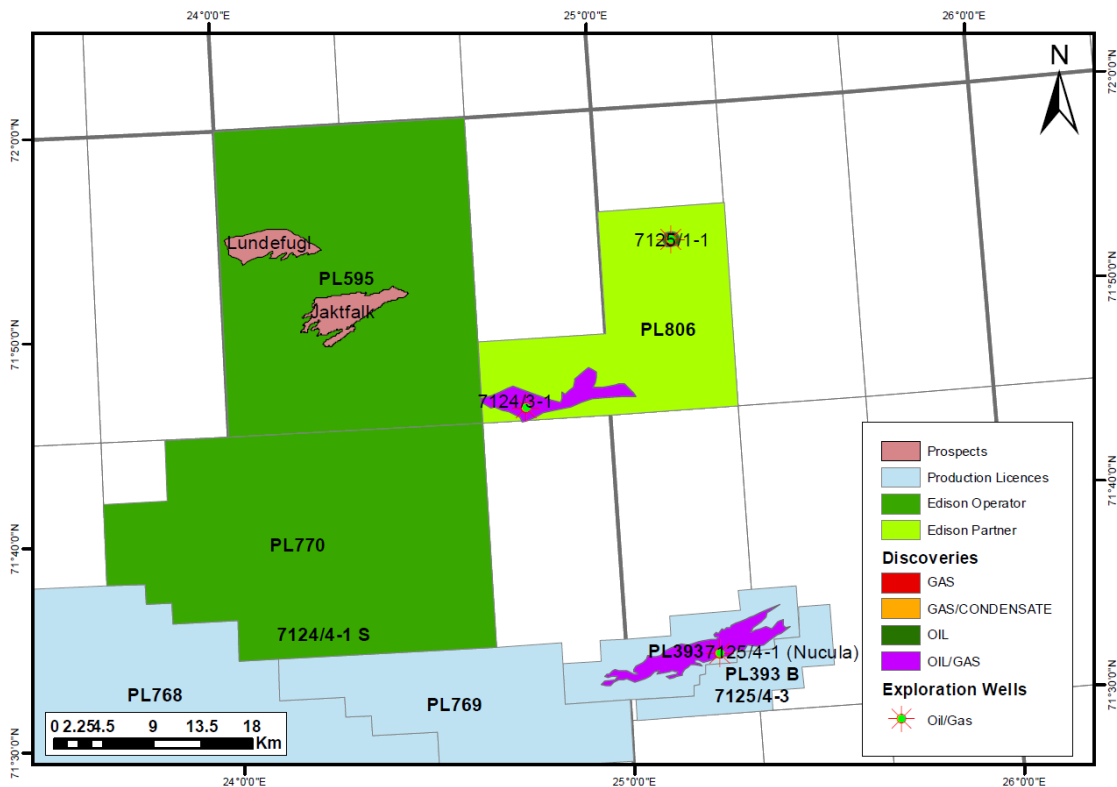


Figure 1.1: The figure is showing the current PL595 licenced area, nearby licences and discoveries. The evaluated prospects, Jaktfalk and Lundefugl, are outlined in the figure.

The area was applied for in APA 2010 and the PL595 was awarded in February 2011. Several comprehensive studies have been performed on the license in order to decrease the main risks related to charge, fault- seal and reservoir presence. The evaluation shows that the final volumes are not enough to make the prospects economical viable for the Barents Sea and the license group has unanimously decided to relinquish the license. Figure 1.1 shows an overview of the license and the prospects that has been evaluated.

The license work program is listed in section 1.2. The work program has been fulfilled with the main objectives to obtain new data and conduct studies in order to reduce risk and improve the understanding of the prospectivity. The license applied for a one year postponement of the drill or drop decision in order to fully evaluate the potential of the license. Due to the high risk related to reservoir presence and retention, in addition to the limited volumes evaluated, the JV has decided to drop the licence. This is the basis for the application of a full relinquishment of the license.

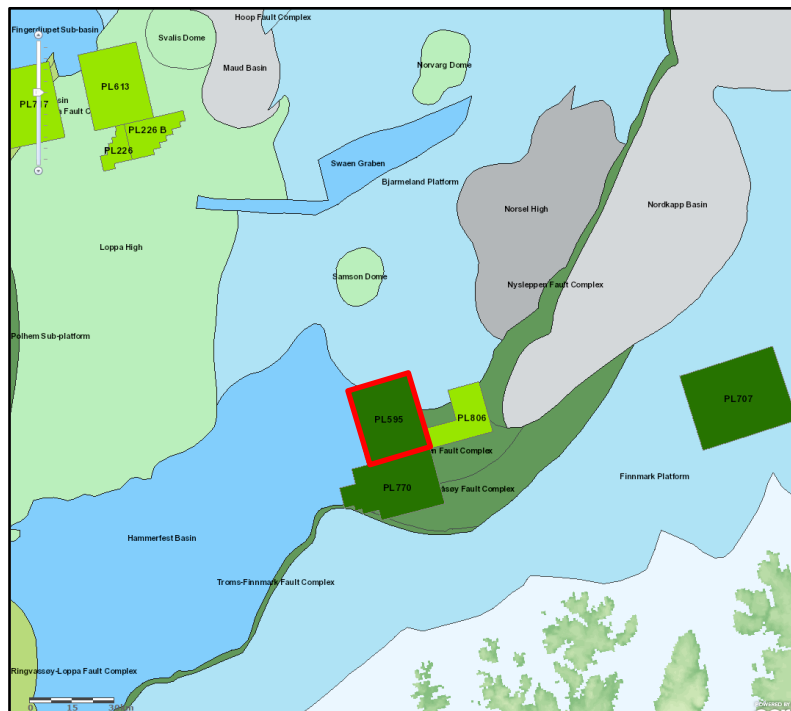


Figure 1.2: Map showing the main structural provinces in the PL595 area. The PL595 is located close to the Nysleppen and Måsøy fault complexes in the transition zone between Hammerfest and Nordkapp basin.

1.2 Work program and duration

PL 595 was awarded in February 2011 with Edison Norge as the Operator (60%) and North Energy as a partner (40%).

License history, applications and deadlines can be summarised as followed:

- License History:
 - Acquired directly in APA 2010
 - Application for extension accepted in December 2013, New DoD February 2015
 - Recommendation to license partner for full relinquishment in November 2014 as the technical work of the license indicates no prospectivity of commercial value in the license.
- Initial Commitments & Restrictions:
 - Acquire 3D seismic over the license area and conduct G&G studies
- Initial period of 8 years:
 - DoD decision by 4.2.2015
- License Meetings
 - 2 EC/MC meetings per year from license award
 - 2 License Work meeting per year from license award

The main part of the work program was performed between February 2010 and October 2014.

2. Database

2.1 Seismic database

The 3D seismic data used for PL 595 evaluation is shown in Figure 2.1. A 3D cube (Bjarmeland 3D Multiclient), covering PL 595 was acquired in 2011 by Polarcus . Available public 2D seismic surveys were also included in the common data base (See figure 2.1).

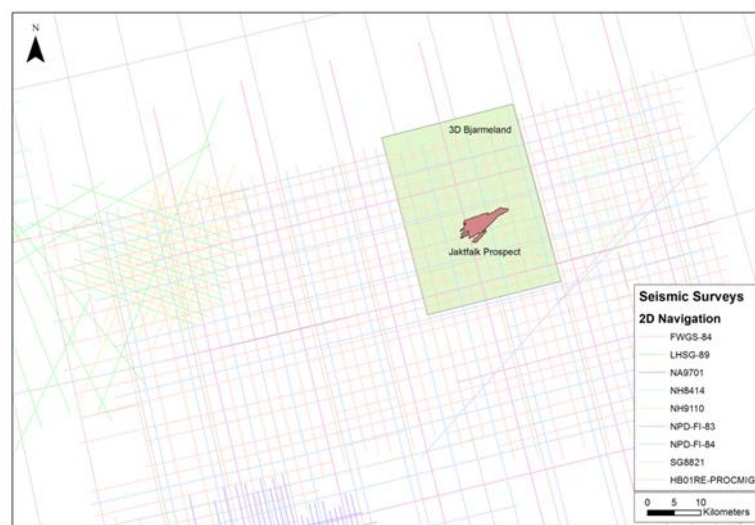


Figure 2.1: Seismic data base for PL595.

2.2 Well database

The well database for PL595 is shown in table 1. All of the wells in the common database lie outside the 3D seismic survey. In order to tie the closest well (7124/3-1) to the seismic, a 2D line was extracted from the 3D cube. Two seismic swaths were purchased in 2014 by the Operator only, in order to also include the 7125/1-1 well.

Well Name	Year	Discovery/Field	TD		
			Formation	Age	Depth (MD)
7122/2-1	1992		Ste	Middle Triassic	2120
7122/4-1	1991		Snadd	Late Triassic	3015
7122/6-1	1987	7122/6-1	Snadd	Middle Triassic	2707
7122/6-2	2006	7122/6-1	Kobbe	Middle Triassic	3070
7122/7-1	2000	Goliat	Snadd	Late Triassic	1524
7122/7-2	2001	Goliat	Snadd	Late Triassic	1418
7122/7-3	2005	Goliat	Roye	Late Permian	2726
7122/7-4S	2006	Goliat	Havert	Early Triassic	2550
7122/7-5	2006	Goliat	Klagomyss	Early Triassic	2228
7122/7-5A	2006	Goliat	Kobbe	Middle Triassic	2186
7123/4-1S	2008	7122/6-1	Snadd	Late Triassic	2920
7123/4-1A	2008	7122/6-1	Snadd	Late Triassic	2855
7124/3-1	1987	7124/3-1	Øm	Late Carboniferous	4730
7124/4-1S	2011		Havert	Early Triassic	2814
7125/1-1	1988	7125/1-1	Kobbe	Middle Triassic	2200
7125/4-1	2007	7125/4-1	Klagomyss	Early Triassic	1615
722/11-1	2008	722/11-1	Kobbe	Middle Triassic	2848

Table 1: Common well data base for PL595.

3. Review of geological Framework

3.1 Studies

Several comprehensive studies have been performed on the license since it was awarded. The purpose of these studies has been to increase the confidence in the geological and geophysical understanding of the area potential. An overview of the studies performed on PL595 is listed below:

- Petrophysical analysis (in-house)
- Basin modelling (IGI)
- Rock Physics and Inversion study (in-house)
- Structural validation and Fault Seal Analysis (in-house)
- Pore pressure evaluation (in-house)
- Geological and sedimentological framework (in-house)

3.2 Results of Block Evaluation

For the initial evaluation done for the APA 2010, the probability of discovery was calculated to 0.22 where the main risks were associated to having leakage along faults causing under-filling of the structure. Under-filling is one of the main issues with the nearby discoveries in the area and a risk that has been well addressed in the work program. A structural validation and fault seal analysis has been performed in order to assess the sealing potential of the prospect bounding faults. The results shows that the larger faults trending E-W and NW-SE have good sealing potential while the smaller and more segmented faults trending NE-SW have lower sealing potential and are more likely to leak. Even with 3D we cannot establish with certainty that the structure closes at the critical area in eastern part of the Jaktfalk structure.

Under-filling of structures could also be due to issues related to source rock maturation, expulsion and migration. As part of the work program, a basin modelling study was performed investigating the different source rocks in the area as well as the burial history, source rock potential and migration history. The study shows that the nearby discoveries have a mixed source rock signature with an increased mixing towards the Nordkapp basin, although the source rock signature is predominantly the Hekkingen Fm. The Hekkingen Formation is modelled to be early mature in the Hammerfest Basin and that the PL595 is in an ideal location in terms of hydrocarbon migration. The study also showed that some contribution to charge is also likely from local deeper source rocks such as the Snadd and Kobbe Formation.

One of the major changes in the evaluation of the Jaktfalk prospect has been the risk associated to the reservoir presence. The new 3D seismic and the acquisition of the two swaths covering the two closest wells show that the main reservoir, the Tubåen formation, has a significant thinning towards the Jaktfalk prospect. The thinning of the reservoir has had a big impact on the volumes associated. Also the seismic inversion study performed on this licence indicated that the Tubåen formation might be eroded or be below the seismic resolution.

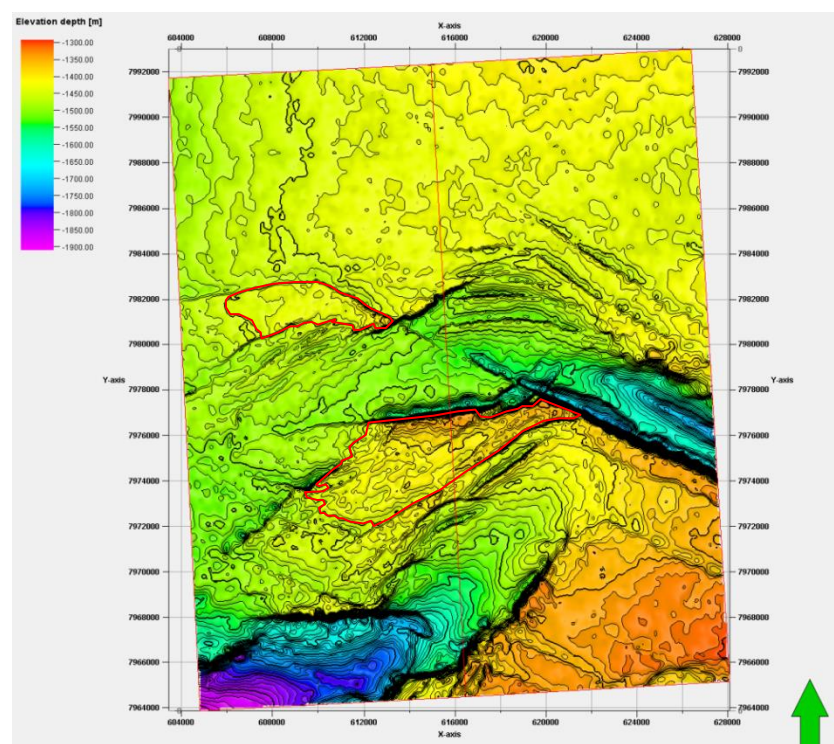


Figure 3.2: Depth map over the Tubåen formation showing the two evaluated prospect, Jaktfalk and Lundefugl.

4. Prospect Update

The PL595 is located east of the two discoveries Bamse and Binne which found oil and gas in the Tubåen formation. The main prospect that was evaluated for the APA2010 (see table 2) was the Jaktfalk prospect which had the main target in the Tubåen formation and an additional target in the Snadd formation. After the acquisition of 3D seismic, additional potential was found in the northern part of the licence with a similar structure as the Jaktfalk structure. The lead has been matured into a prospect called the Lundefugl prospect consisting of similar targets as the Jaktfalk prospect.

Discovery/ Prospect/ Lead name	D/ P/ L	Unrisked recoverable resources						Probability of discovery	Part in acreage applied for %	Reservoir		Distance to infra- structure (km)
		Oil 10 ⁶ Sm ³			Gas 10 ⁶ Sm ³					Litho-/ Chrono- stratigraphic level	Reservoir depth (m MSL)	
		Low	Base	High	Low	Base	High					
Jaktfalk, Sto-Tubåen	P	5.37	9.68	47.90	0.63	1.21	6.08	0.22	100	Sto-Tubåen/Jurassic Bajocian - Hettangian	1415	80
Jaktfalk, Snadd	L	5.15	9.46	14.60	0.61	1.44	2.49	0.08	100	Snadd (sand) Formation/ Up. Triassic Norian-Carnian	1550	80

Table 2: NPD format prospect summary table APA2010.

Prospect	P90 Oil (10 ⁶ Sm ³)	P50 Oil (10 ⁶ Sm ³)	P10 Oil (10 ⁶ Sm ³)	Pmean Oil (10 ⁶ Sm ³)	Risk
Jaktfalk, Tubåen	10.7	23.3	48.7	27.1	0.28
Jaktfalk, Fruholmen	2.1	6.6	19.3	9.1	0.31
Jaktfalk, Snadd	1.5	4.2	11.6	5.6	0.17
Lundefugl, Tubåen	2.2	6.2	17	8.2	0.37
Lundefugl, Fruholmen	0.3	0.7	1.9	1.0	0.27
Lundefugl, Snadd	0.2	0.6	1.3	0.7	0.14

Table 3: Updated prospect summary table.

The main reservoir, the Tubåen Formation (See figure 3.2 for map over the Tubåen Fm) has been penetrated by the nearby wells, although a significant thinning is observed moving from the 7125/1-1 discovery where 120 meters of sandstone was encountered towards the 7124/3-1 well where only 20 meters of Tubåen Formation was penetrated. Due to several indications both from seismic interpretation and seismic inversion, it has been concluded that the Tubåen Formation is close to or below seismic resolution with thicknesses ranging from 0 -20 meters in the Jaktfalk prospect (see figure 4.1). This has significantly reduced the volumes prognosis in the Jaktfalk prospect. A thicker section of the Tubåen formation is observed in the Lundefugl prospect but due to a smaller area, the volumes are smaller than in the Jaktfalk prospect. The underlying secondary target, the Fruholmen formation is likely to be thicker in the Jaktfalk and Lundefugl area, but due to the small closure and the likely poorer reservoir quality, the volumes are lower than for the Tubåen Formation. The channel systems in the Snadd formation has been a third target in both the Lundefugl and Jaktfalk prospect but due to a smaller closure and poorer reservoir quality, the volumes are minor (see table 3).

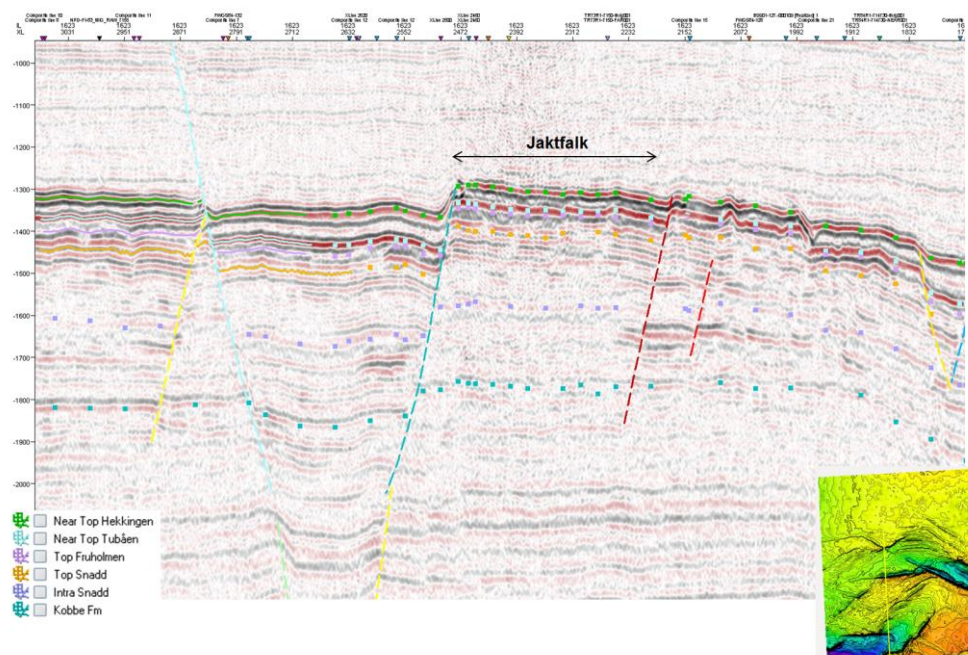


Figure 4.1: Seismic section of the Jaktfalk prospect showing the main targets Tubåen, Fruholmen and Snadd Fm. The thinning of the Tubåen formation can be observed in the Jaktfalk area.

5. Technical Evaluation

PL595 is located about 85 km north-east of the Goliat discovery. Due to the limited infrastructure for export within the vicinity of the prospect, the use of a Floating Production Unit with direct export is not feasible. The main development scenario that has been considered is therefore a Floating Production Storage and Offloading (FPSO) vessel. With the volumes evaluated for the Jaktfalk and Lundefugl prospects it will not be sufficient to carry a standalone facility.

6. Conclusion

The license partners in PL 595 consider that the technical work done since the time of the award is comprehensive and that the geological and commercial risk of the prospectivity is too high. The main risk elements are associated with the reservoir presence and retention of hydrocarbons.

Although the Jaktfalk area is close to several discoveries and in the play fairway of the Hekkingen formation, the risk and volumes prognosis does not justify a drilling decision. Comprehensive technical studies have not reduced any risk parameters significantly and the operator evaluated that there are limited studies to further de-risk.

The recommendation to relinquish is based on this evaluation and concludes that there are no viable commercial exploration targets within PL595 acreage. The partnership had therefore agreed to relinquish the entire license area.