REPUBLIC OF SERBIA
MINISTRY OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL IMPACT ASSESSMENT STUDY OF PROJECT OF CONSTRUCTION OF WIND FARM ON THE LOCALITY OF KOSTOLAC

EKO PLAN -PLANIRANJE, PROJEKTOVANJE I INŽENJERING U OBLASTI ZAŠTITE ŽIVOTNE SREDINE
Sergeja Jesenjina 16, 11080 Beograd, www.eko-plan.rs

NETINVEST Д.О.О. - INŽENJERING, STUDIJE OPRAVDANOSTI, KONSALTING
Trg Nikole Pašića 1, 11000 Beograd, www.netinvest.rs

Belgrade, August 2018

DOCUMENTATION TITLE: ENVIRONMENTAL IMPACT ASSESSMENT STUDY OF PROJECT OF CONSTRUCTION OF WIND FARM ON THE LOCALITY OF KOSTOLAC

PROJECT HOLDER: Public enterprise "Elektroprivreda Srbije"
Balkanska 13
Belgrade

REPRESETATIVE OF THE PROJECT HOLDER: dr Milka Domazet, PhD Eng.

STUDY PROCESSORS: EKO PLAN (www.eko-plan.rs)
Sergeja Jesenjina 16
Belgrade
Biljana Knežević, dipl. ing. techn. (director)

NETINVEST (www.netinvest.rs)
Trg Nikole Pašića 1
Beograd
Zoran Butulija, dipl.eng.el. (director)

STUDY DEVELOPMENT EXPERT TEAM: dr Boško Josimović, PhD, senior research associate, head of study

---

dr Milan Paunović, PhD biology
Marko Raković, dipl. biology
Sonja Mudri-Stojnić, dipl. ecology
Biljana Knežević, dipl. ing. techn.
Ivan Stanković, dipl. ing. arch.
Ladislav Nikolic, dipl. ing. civ.
Jovan Jovanović, dipl. ing. mach.
Zoran Butulija, dipl. ing. el.
Filip Kanački, MSc Arch.
Vera Blažon, dipl. env. analyst

Република Србија
Агенција за привредне регистре

5000020235562

АПР - Регистар привредних субјеката

Број БП 98745/2009

Датум 14.07.2009 године
Београд

Агенција за привредне регистре, Регистратор који води Регистар привредних субјеката, на основу чл. 4. Закона о агенцији за привредне регистре (Службени гласник РС бр. 55/04), чл. 23. став 2. и чл. 25. Закона о регистрацији привредних субјеката (Службени гласник РС бр. 55/04 и 61/05), решавајући по поднетој јединственој регистрационој пријави за регистрацију предузетника, поднетој од стране:

Име и презиме: Биљана Кнежевић
ЈМБГ: 2108969715158

доноси:

Р Е Ш Е Њ Е

Усваја се захтев подносиоца јединствене регистрационе пријаве. У Регистар привредних субјеката региструје се **предузетник**:

Оснивач-предузетник:

Име и презиме: Биљана Кнежевић
ЈМБГ: 2108969715158
Адреса: Прегревица 18, Београд-Земун, Србија

Пуно пословно име предузетника:

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, PREGREVICA 18

Назив: **EKO PLAN**

Пословно седиште: Прегревица 18, Београд-Земун, Србија
Број и назив поште: 11080

Регистарски број/Матични број: **61532609**

ПИБ додељен од Пореске Управе РС: **106205064**

Почетак обављања делатности: 14.07.2009 године
Претежна делатност: **74203** - Инжењеринг
Облик обављања делатности: самосталан

Предузетник се региструје на: неодређено време

Контакт подаци:
Телефон 1: +381 (0)64 2307407
Факс: +381 (0)11 2611049
Е-пошта: blik@nadlanu.com

О б р а з л о ж е њ е

Решавајући по поднетој јединственој регистрационој пријави за регистрацију оснивања и упис у јединствени регистар пореских обвезника, предузетника BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, PREGREVICA 18 , БП 98745/2009 од 10.07.2009 -год., с обзиром да су испуњени услови из члана 22. Закона о регистрацији привредних субјеката и члана 26. Закона о пореском поступку и пореској администрацији (Сл. гласник РС бр. 80/02..20/09), Регистратор је одлучио као у диспозитиву.

Висина накнаде за регистрацију у износу од 540,00 динара одређена је у складу са чланом 7. Уредбе о висини накнаде за регистрацију и друге услуге које пружа Агенција за привредне регистре РС (Службени гласник РС бр. 109/05).

Поука о правном леку:
Против овог решења може се изјавити жалба
Министру надлежном за послове привреде РС,
у року од 8 дана од дана пријема решења,
а преко Агенције за привредне регистре.

РЕГИСТРАТОР

Миладин Маглов

ОБАВЕШТЕЊЕ:

У обавези сте да се у року од 8 дана од дана регистрације пријавите Фонду ПИО
У обавези сте да се у року од 8 дана од дана регистрације пријавите РЗЗО

Република Србија
Агенција за привредне регистре

5000020766196

Регистар привредних субјеката

Број БП 106432/2009

Датум 23.07.2009
Београд

Агенција за привредне регистре, Регистратор који води регистар привредних субјеката, на основу чл. 4. Закона о агенцији за привредне регистре (Службени гласник РС бр.55/04), чл. 23. став 2. и чл. 25. Закона о регистрацији привредних субјеката (Службени гласник РС бр.55/04 и 61/05), решавајући по захтеву за регистрацију промене података који је поднет од стране:

Име и презиме: Снежана Петровић

доноси:

Р Е Ш Е Њ Е

Усваја се захтев подносиоца регистрационе пријаве. У Регистар привредних субјеката региструју се **промене података о предузетнику**:

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, PREGREVICA 18

Матични број: **61532609**

и то следећа промена:

- **Промена пословног седишта:**

Брише се:
Седиште: Прегревица 18, Београд-Земун, Србија
Број и назив поште: 11080

Уписује се:
Седиште: Сергеја Јесењина 16, Београд-Земун, Србија
Број и назив поште: 11185

- **Промена пуног пословног имена:**

Брише се:
BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, PREGREVICA 18

Уписује се:
BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, SERGEJA JESENJINA 16

О б р а з л о ж е њ е

Подносилац регистрационе пријаве поднео је дана 22.07.2009 регистрациону пријаву за регистрацију промене података о привредном субјекту уписаном у Регистар привредних субјеката као:

BILJANA KNEŽEVIĆ PR, AGENCIJA ZA PROJEKTOVANJE I INŽENJERING EKO PLAN, ZEMUN, PREGREVICA 18

Решавајући по захтеву подносиоца регистрационе пријаве, с обзиром да су испуњени законом прописани услови, Регистратор је одлучио као у диспозитиву.

Висина накнаде за регистрацију у износу од 300,00 динара одређена је у складу са чланом 7., 8., 9., и 10. Уредбе о висини накнаде за регистрацију и друге услуге које пружа Агенција за привредне регистре РС (Службени гласник РС број 109/05).

Поука о правном леку:
Против овог решења може се изјавити жалба
Министру надлежном за послове привреде РС,
у року од 8 дана од дана пријема решења,
а преко Агенције за привредне регистре.

РЕГИСТРАТОР

Миладин Маглов

8000050605554

ИЗВОД О РЕГИСТРАЦИЈИ ПРИВРЕДНОГ СУБЈЕКТА

Република Србија
Агенција за привредне регистре

ОСНОВНИ ИДЕНТИФИКАЦИОНИ ПОДАТАК

Матични / Регистарски број	06204201

СТАТУС

Статус привредног субјекта	Активно привредно друштво

ПРАВНА ФОРМА

Правна форма	Друштво са ограниченом одговорношћу

ПОСЛОВНО ИМЕ

Пословно име	NETINVEST PREDUZEĆE ZA PROIZVODNJU, PROMET I USLUGE DOO, BEOGRAD (STARI GRAD)
Скраћено пословно име	NETINVEST DOO BEOGRAD

ПОДАЦИ О АДРЕСАМА

Адреса седишта

Општина	Београд-Стари Град
Место	Београд-Стари Град
Улица	Трг Николе Пашића
Број и слово	1
Спрат, број стана и слово	М / 5 /

ПОСЛОВНИ ПОДАЦИ

Подаци оснивања

Датум оснивања	20. октобар 1992

Време трајања

Време трајања привредног субјекта	Неограничено

Претежна делатност

Шифра делатности	7112
Назив делатности	Инжењерске делатности и техничко саветовање

Остали идентификациони подаци

Порески Идентификациони Број (ПИБ)	100053452

Подаци од значаја за правни промет

Текући рачуни

170-0039006024002-77
200-2707780101003-53
200-2707780101033-60
160-0000000366961-46
170-0000000001188-39
190-0070100049919-84
190-0000000016760-50
170-0039006024017-32
170-0039006024009-56
250-1540000235770-77
170-0039006024006-65
250-1540000204070-20
170-0039006024004-71

Подаци о статуту / оснивачком акту

Не постоји обавеза овере измена оснивачког акта

Датум важећег статута

Датум важећег оснивачког акта

Законски (статутарни) заступници

Физичка лица

1. Име: Зоран Презиме: Бутулија

ЈМБГ: 1504963153955

Функција: Директор

Ограничење супотписом: не постоји ограничење супотписом

Чланови / Сувласници

Подаци о члану

Име и презиме: Зоран Бутулија

ЈМБГ: 1504963153955

Подаци о капиталу

Новчани

износ: Уписан: 178.335,27 RSD — датум:

износ: Уписан: 300.000,00 RSD — датум:

износ — датум:

Уплаћен: 178.335,27 RSD	23. август 2001

износ	датум
Уплаћен: 300.000,00 RSD	8. новембар 2013

Неновчани

вредност	датум	опис
Уписан: 29.150,42 RSD		у стварима

вредност	датум	опис
Унет: 29.150,42 RSD	30. новембар 2004	у стварима

	износ(%)
Сувласништво удела од	**100,00000**

Основни капитал друштва

Новчани

износ	датум
Уписан: 300.000,00 RSD	

износ	датум
Уписан: 178.335,27 RSD	

износ	датум
Уплаћен: 178.335,27 RSD	23. август 2001

износ	датум
Уплаћен: 300.000,00 RSD	8. новембар 2013

Неновчани

вредност	датум	опис
Уписан: 29.150,42 RSD		у стварима

вредност	датум	опис
Унет: 29.150,42 RSD	30. новембар 2004	у стварима

Регистратор, Миладин Маглов

ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПЛАНЕРА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Бошко Д. Јосимовић

дипломирани просторни планер
ЈМБ 1807974710026

одговорни планер

Број лиценце
100 0141 09

У Београду,
24. децембра 2009. године

ПРЕДСЕДНИК КОМОРЕ
Проф. др Драгослав Шумарац
дипл. грађ. инж.

ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ УРБАНИСТЕ

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Филип С. Каначки

дипломирани инжењер архитектуре
ЛИБ 07082079258

одговорни урбаниста

за руковођење израдом урбанистичких планова и урбанистичких пројеката

Број лиценце
200 1514 15

ПРЕДСЕДНИК КОМОРЕ

Проф. др Милисав Дамњановић
дипл. инж. арх.

У Београду,
9. јула 2015. године

ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Владислав Д. Николић

дипломирани грађевински инжењер
ЈМБ 2108950714037

одговорни пројектант

грађевинских конструкција објеката високоградње, нискоградње и хидроградње

Број лиценце
310 G621 08

У Београду,
18. септембра 2008. године

ПРЕДСЕДНИК КОМОРЕ
Проф. др Драгослав Шумарац
дипл. грађ. инж.

ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Јован М. Јовановић

дипломирани машински инжењер
ЛИБ 08081068312

одговорни пројектант

термотехнике, термоенергетике, процесне и гасне технике

Број лиценце
330 M272 13

РЕПУБЛИКА СРБИЈА • ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ • БЕОГРАД

ПРЕДСЕДНИК КОМОРЕ

Милован Главоњић
дипл. инж. ел.

У Београду,
9. маја 2013. године

ИНЖЕЊЕРСКА КОМОРА СРБИЈЕ

ЛИЦЕНЦА

ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу Закона о планирању и изградњи и
Статута Инжењерске коморе Србије

УПРАВНИ ОДБОР ИНЖЕЊЕРСКЕ КОМОРЕ СРБИЈЕ
утврђује да је

Зоран О. Бутулија

дипломирани инжењер електротехнике
ЈМБ 1504963153955

одговорни пројектант

електроенергетских инсталација ниског и средњег напона

Број лиценце

350 F505 07

ПРЕДСЕДНИК КОМОРЕ

Проф. др Драгослав Шумарац
дипл. грађ. инж.

У Београду,
15. новембра 2007. године

ЈАВНО ПРЕДУЗЕЋЕ „ЕЛЕКТРОПРИВРЕДА С
ПРИМЉЕНО: 23 -09- 2016
Орг. јед. | Број | Прилог
1200 | 1201 | 353/1 | 58

Република Србија
МИНИСТАРСТВО ПОЉОПРИВРЕДЕ
И ЗАШТИТЕ ЖИВОТНЕ СРЕДИНЕ
Број: 353-02-01621/2016-16
Датум: 13.09.2016.

На основу чл. 14. и 32. Закона о процени утицаја на животну средину («Сл. гласник РС», 135/04 и 36/09), чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07), чл. 192. став 1. Закона о општем управном поступку („Сл. лист СРЈ“, 33/97, 31/01 и „Сл. гласник РС“, 30/10), члана 5. и члана 37. став 5. Закона о министарствима („Сл. гласник Р С“, 44/2014), члана 23. став 2.и члана 24. став 2. Закона о државној управи ("Сл. гласник РС", 79/2005, 101/2007, 95/2010 и 99/2014), поступајући по захтеву носиоца пројекта, ЈП ЕЛЕКТРОПРИВРЕДА СРБИЈЕ, из Београда, Царице Милице 2, Министарство пољопривреде и заштите животне средине доноси

Р Е Ш Е Њ Е

1. ОДРЕЂУЈЕ се обим и садржај Студије о процени утицаја на животну средину Пројекта изградње парка ветроелектрана на локалитету Костолца на: КП 429, 452/1, 468, 475, 522, 547 и 612 КО Брадарац, КП 2896, 2482/1, 1433 и 1417 КО Кленовник, КП 1550 и 1551 КО Ћириковац и КП 2604 и 1640/1 КО Костолац-село, територија Града Пожаревца, од укупно 20 ветроагрегата снаге 3,3 MW и укупне инсталисане снаге 66 MW, предвиђен Просторним планом подручја посебне намене Костолачког угљеног басена („Сл. гласник РС“, 1/2013).
2. Обавеза носиоца пројекта је да Студију изради у свему према чл. 17. Закона о процени утицаја на животну средину („Сл. гласник РС“, 135/04 и 36/09) и чл. 1-10 Правилника о садржини студије о процени утицаја на животну средину («Сл. гласник РС» 69/05) и обавезама које проистичу из Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07).
3. Нетехнички краћи приказ података наведених у студији израдити као посебан сепарат студије који садржи кључне изводе и податке из свих поглавља студије, написане једноставним нетехничким језиком, са мерама заштите животне средине и програмом праћења утицаја на животну средину, који се наводе у интегралном тексту из студије.
4. Уз студију о процени утицаја приложити копије услова и сагласности других надлежних органа и организација издатих у складу са посебним законом.
5. Носилац пројекта дужан је да, у року од годину дана од дана коначности овог решења, поднесе захтев за давање сагласности на студију о процени утицаја пројекта на животну средину из тачке 1. овог решења.

О б р а з л о ж е њ е

Носилац пројекта ЈП ЕЛЕКТРОПРИВРЕДА СРБИЈЕ из Београда, Царице Милице 2, обратио се овом органу захтевом бр. 353-02-01621/2016-16 од 08.08.2016. године, за одређивање обима и садржаја Студије о процени утицаја на животну средину Пројекта изградње парка ветроелектрана на локалитету Костолца на: КП 429, 452/1, 468, 475, 522, 547 и 612 КО Брадарац, КП 2896, 2482/1, 1433 и 1417 КО Кленовник, КП 1550 и 1551 КО Ћириковац и КП 2604 и 1640/1 КО Костолац-село, територија Града Пожаревца, од укупно 20 ветроагрегата снаге 3,3 MW и укупне инсталисане снаге 66 MW, предвиђен Просторним планом подручја посебне намене Костолачког угљеног басена („Сл. гласник РС“, 1/2013).

Уз захтев и упитнике достављени су:

- Информација о локацији бр. 350-01-04615/2016-14 од 02.08.2016. коју је издало Министарство грађевинарства, саобраћаја и инфраструктуре;
- Графички прилог макро и микролокације ветроелектране Костолац;
- Решење Завода за заштиту природе Србије бр. 03 020-2775/2 од 29.12.2014.
- Решење о условима за израду пројектне документације за изградњу ветропарка Костолац бр. 399/2 -2014 од 16.12.2014. које је издао Регионални завод за заштиту споменика културе из Смедерева;
- Услови за израду техничке документације бр 14207/1 од 08.12.2014. које је дало ЈП СРБИЈАШУМЕ;
- Услови за израду техничке документације бр 06-03/22517 од 22.01.2015. које је дало ЈП СРБИЈАГАС;
- Услови ТЕЛЕКОМ СРБИЈА АД бр. 382821/2-2014 од 02.02.2014.;
- Извод из идејног пројекта изградње парка ветроелектрана на локалитету Костолца са ситуационим планом планираних зона изградње, који је израдио НЕТИНВЕСТ PR/EPS-VPK/16 из Београда, Теразије 12/V;
- Мониторинг птица и слепих мишева за потребе пројекта изградње ветроелектране Костолац који је израдио FAUNA C&M из Нових Бановаца, Земунска 19;
- Информација о предложеним активностима изградње 20 ветроагрегата са пратећим елементима за експлоатацију на локалитету Костолац, у складу са чл. 32. Закона о процени утицаја на животну средину («Службени гласник РС», број 135/04 и 36/09) и чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07) на српском и енглеском језику;

Поступајући по предметном захтеву овај орган је, обавестио заинтересоване органе, организације и јавност, организовао јавни увид и обезбедио доступност података из захтева и документације носиоца пројекта, путем штампаних медија (оглас у листу “Данас” од 15.08.2016.) и преко сајта Министарства, сходно одредбама члана 14., а у вези са чланом 29. Закона о процени утицаја на животну средину.

Коментаре су у законском року је доставила НВО Центар за екологију и одрживи развој (ЦЕКОР) из Суботице, Корзо 15/13.

Примедбе се односе на: могућност кумулативног ефекта са ефектима других пројеката у вези са изворима буке, рекултивацијом подручја захваћеног рударством и пратећим индустријским активностима, миграционе руте птица (мрежа НАТУРА 2000), као и утицај саобраћајница које повезују насеља у локалу.

Планирани пројекат предвиђа изградњу комплекса ветроелектране Костолац на просторима спољних одлагалишта и јаловишта у Костолцу, настала као последица рударских активности. Комплекс се састоји од следећих функционалних подцелина:

- Ветроагрегата који представљају генераторске јединице и састоје се од ротора, гондоле, торња и темеља, напонског нивоа 690 kV/35 kV;
- Унутрашње кабловске мреже (подземни кабловски водови напонског нивоа 35k V;
- Трафо станице 35 kV/110 kV са командном и управном зградом преко које се ветроелектрана прикључује на преносни систем ради пласмана произведене електричне енергије и одакле се управља радом електране;
- Приступних путева, који се може поклапати са са трасом унутрашње кабловске мреже делимично, или у потпуности;

Ветроелектрана се састоји од инфраструктурних објеката за производњу електричне енергије, објеката за пренос енергије, приступних саобраћајница и простире се на захвату од 60 km^2, тако да се заузима површина од 20 m^2 испод сваког ветроагрегата (тачкаста примена), док темељна стопа која је укопана има радијус до 25 метара. Предвиђено је позиционирање 20 ветроагрегата појединачне снаге 3,3 MW, тако да је укупна инсталисана снага 66 MW.

Сагласно чл. 32. Закона о процени утицаја на животну средину («Сл. гласник РС», број 135/04 и 36/09) и чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07), попуњени обрасци на српском и енглеском језику постављени су на сајт Министарства и у електронској форми прослеђени Републици Румунији, због потенцијалног прекограничног утицаја пројекта на животну средину.

Уредбом Владе Србије утврђена је Листа пројеката за које је обавезна процена утицаја и Листе пројеката за које се може захтевати процена утицаја на животну средину („Сл. гласник РС“ 114/08), при чему се предметни пројекат –уређаји за коришћење снаге ветра у циљу производње електричне енергије (фарме ветрењача) може се сврстати у тачку 3. подтачка 3) – Производња енергије, Листе пројеката за које се може захтевати процена утицаја на животну средину.

Неповољни утицаји ветроелектрана на животно окружење представљају ризици на увећање морталитета птица и слепих мишева, повећање буке током рада, као и на доминантни визуелни аспект подручја. Такође, екстремни хаваријски акциденти могу да доведу до делимичног загађења земљишта.

У складу са тим, а на основу члана 14. и члана 17. Закона о процени утицаја на животну средину («Службени гласник РС», број 135/04 и 36/09), као и на основу члана 1. и чланова 2. до 10. Правилника о садржини студије о процени утицаја на животну средину («Службени гласник РС», број 69/05), утврђен је обим и садржај предметне студије.

У вези са изложеним, утврђена је обавеза носиоца пројекта да, у року од годину дана од дана коначности овог решења, поднесе захтев за давање сагласности на студију о процени утицаја пројекта на животну средину из тачке 1. овог решења.

Плаћена је републичка административна такса у износу од 1 920,00,00 динара у складу са Законом о републичким административним таксама („Сл. гласник РС“ 47/13 и 57/2014), тарифни број 186.

ПОУКА О ПРАВНОМ ЛЕКУ: Против овог решења може се уложити жалба Влади Републике Србије путем овог органа у року од 15 дана од дана пријема решења, односно од дана обавештавања заинтересоване јавности о донетом решењу.

Помоћник министра
По решењу о овлашћењу
бр. 021-01-43/2016-01 од 17.08.2016.

Александар Весић

Доставити:
-наслову
-архиви

C O N T E N T

1. INTRODUCTION 5

2. SITE DESCRIPTION 7

2.1. Physical-geographic characteristics of the site 7
2.2. Natural characteristics and conditions 15
2.2.1. Geomorphological characteristics of the terrain 15
2.2.2. Flora and fauna 17
2.2.2.1. Butterflies fauna 18
2.2.3. Climate characteristics 21
2.2.4. Pedological characteristics 24
2.2.5. Seismic characteristics 25
2.2.6. Hydrological characteristics 29
2.3. Overview of species of birds and bats of the study area and surroundings 31
2.3.1. Results of one-year ornithofauna monitoring 31
2.3.2. Conclusions of the one year ornithofauna monitoring 42
2.3.3. Results of one-year monitoring of hiropterofauna 45
2.3.4. Conclusions of a one-year monitoring of hyropterofauna 48
2.4. Overview of cultural heritage 53
2.5. Overview of settlements and infrastructure 53

3. PROJECT DESCRIPTION 55

4. REVIEW OF MAIN ALTERNATIVES 71

5. REPRESENTATION OF THE ENVIRONMENTAL STATE 80

6. DESCRIPTION OF POSSIBLE SIGNIFICANT IMPACTS OF THE PROJECT ON THE ENVIRONMENT 84

6.1. General assessment of possible environmental impacts 84
6.2. Quantitative-qualitative multicriterial assessment of the environmental impact 87
6.2.1. Estimated effect of impact factors on individual components of the environment 93
6.2.1.1. Physical components 93
6.2.1.2. Biological components 95
6.2.1.3. Socio - Cultural Components 96
6.3. Collective effect of impact factors on environmental components 98
6.3.1. Summary of the possible impacts 99
6.4. Cross-border impacts 101

7. ENVIRONMENTAL IMPACT ASSESSMENT IN CASE OF ACCIDENTS 104

7.1. Earthquake risk exposure of the project 105

8. ENVIRONMENTAL PROTECTION MEASURES 108

8.1. Measures during the connstruction 108
8.2. Protection of substation complex measures 110
8.3. Measures during the operation 111
8.4. Waste management measures 112
8.5. Accident protection measures 112

8.6. Measures for preventing and mitigating the impact during the closure of the wind farm 113

9. ENVIRONMENTAL IMPACT MONITORING PROGRAM..... 115

10. CONCLUSION..... 116

LEGAL REGULATIONS USED IN THE STUDY 118

GRAPHICAL ANNEXES 120

ANNEX I 121

DOCUMENTATION 122

1. INTRODUCTION

Pursuant to the Law on Planning and Construction (Official Gazette of RS No. 72/2009, 81/2009, 24/2011 and 145/14), for the objects over 50 meters high, facilities for electricity generation of 10 MW and more, electricity lines of transformer stations of voltage 110 kV and more; facilities for the production of energy from renewable energy sources with a capacity of 10 MW or more, a construction permit is issued by the Ministry in charge of civil engineering affairs (according to Article 133 of the Law), and based on the Project for Construction Permit with accompanying documentation, which, among other things, contains Environmental Impact Assessment Study.

A special document defines a list of projects/facilities for which environmental impact assessment is mandatory (Regulation on the establishment of a list of projects for which an environmental impact assessment is mandatory and projects for which an environmental impact assessment can be required, Official Gazette of the Republic of Serbia, No. 114/2008). According to this Regulation, facilities for the production of electricity in wind farms exceeding 10 MW and 110 kV transmission lines are on List II, so they can be requested for the development of a Study on Environmental Impact Assessment.

The Law on the Environmental Impact Assessment (Official Gazette of RS No. 135/04, 36/09) defines the procedure of impact assessment for projects that can have significant impacts on the environment, which includes:

- defining the contents of the Environmental Impact Assessment Study by the Competent Authority, abased on the Request submitted by the Investor,
- implementation of the process of participation of interested bodies and organizations and the public at all development phases of the Study,
- cross-border notification by the Competent Authority for projects that may have significant impacts on the environment of another state,
- implementation of the process of drafting and approving the study, which results in the approval of the study or the refusal of a study by the Competent Authority,
- supervision and other issues of importance for environmental impact assessment.

In accordance with the above, the Ministry of Agriculture and Environmental Protection of the Republic of Serbia, within its competencies and in accordance with the provisions of the Law on Environmental Impact Assessment (Official Gazette of RS, No. 135/04 and 36/09), and upon the request of the project holder PE „Elektroprivreda Srbije“, adopted a Decision determining the need for development and determining the scope and content of the on the Environmental Impact Assessment Study of the project for Construction of wind farm on the locality of Kostolac (Decision No: 353-02-01621/2016 -16, dated September 13, 2016).

For the needs of the Study, the project holder PE "Elektroprivreda Srbije" conducted the public procurement procedure - JN/1000/0162/2016, after which the work was awarded to the company NETINVET d.o.o. from Belgrade (Service Provider) and company EKO PLAN from Belgrade (a member of the group), who gathered a multidisciplinary team for the development of the subject Study, which is usually a part of the documentation needed in the process of obtaining approval for the construction and preparation of the remaining documentation.

In the preparation phase of the appropriate technical documentation necessary for the start of the project implementation, the Project holder has conducted consultations with the relevant institutions and provided the decisions, opinions, conditions and approvals of the relevant institutions as guidelines for the implementation of the project.

The complex of the planned wind power plant involves the construction/installation of 20 wind turbines, an internal cable network (underground cable lines of 35kV voltage level), a 35/110kV substation with command and administrative building, access roads and a temporary delivery point for the delivery of equipment. The realization of the project that is the subject of the Study is fully in line with the national policy in the field of renewable energy sources (RES) formulated in the Energy Development Strategy of the Republic of Serbia until 2025 with projections until 2030 ("Official Gazette of RS" No. 101/2015) . Its realization will have multiple significance both in terms of positive environmental impact and in terms of increasing the share of RES in total electricity production.

When deciding on the location of the Kostolac wind farm and planning the spatial disposition of individual wind turbines, the principle of preventive environment protection and its factors was applied in order to prevent or minimize possible negative impacts. Regarding the selection of the location of the wind farm, the starting point was innovative and it involved the implementation of the project on devastated soil, which in this case in the previous period was used for mining activities. In doing so, account was taken of the necessary distances from the objects on which the realization and exploitation of the project could have an impact (noise, shadowing, etc.) In the context of the preventive protection of the flying fauna, ie the determination of the appropriate/optimal spatial disposition of the wind turbines, a one-year monitoring of the impact of the subject project was carried out on ornithofauna and hiropterofauna, which analyzed the potentially dominant effects of planned purposes on environmental elements, and the results of monitoring were incorporated into this Study, as an integral part of the text, and in Annex I of the Study. In addition, other observations (phoenix and floristic-vegetation) have been carried out in order to fully understand the existing state of the environment at the project location and identify the possible impacts of the project on the environmental elements.

The task of this Study is to analyze in detail the possible positive and negative impacts of the planned project of the Kostolac wind farm on the environment and on the basis of the obtained results, anticipate the appropriate measures by which the positive impacts will be maintained in the estimated frameworks and the negative impacts would be minimized or completely eliminated.

Main information on project holder:

Name: Public Enterprise "Elektroprivreda Srbije"
Adress: Balkanska 13, 11000 Belgrade
e-mail: milka.domazet@eps.rs
Contact person: dr Milka Domazet, phone: 064/8333-445

PE Elektroprivreda Srbije is a company with activities in the field of energy, which with this and some other projects, emphasizes the production of electricity from renewable sources. The plan of the company is realization of projects in the field of wind energy and other forms of energy produced from renewable sources, raising collective awareness about the

importance of applying renewable energy sources (RES) and improving the energy portfolio of the Republic of Serbia in this area.

2. SITE DESCRIPTION

2.1. Physical-geographic characteristics of the site

The locations of the planned Kostolac wind farm are located in the territory of Pozarevac in the Branicevo district, between the towns of Kostolac and Pozarevac and about 14km by the air line from the border with Romania (Figure 2.1) east of them.

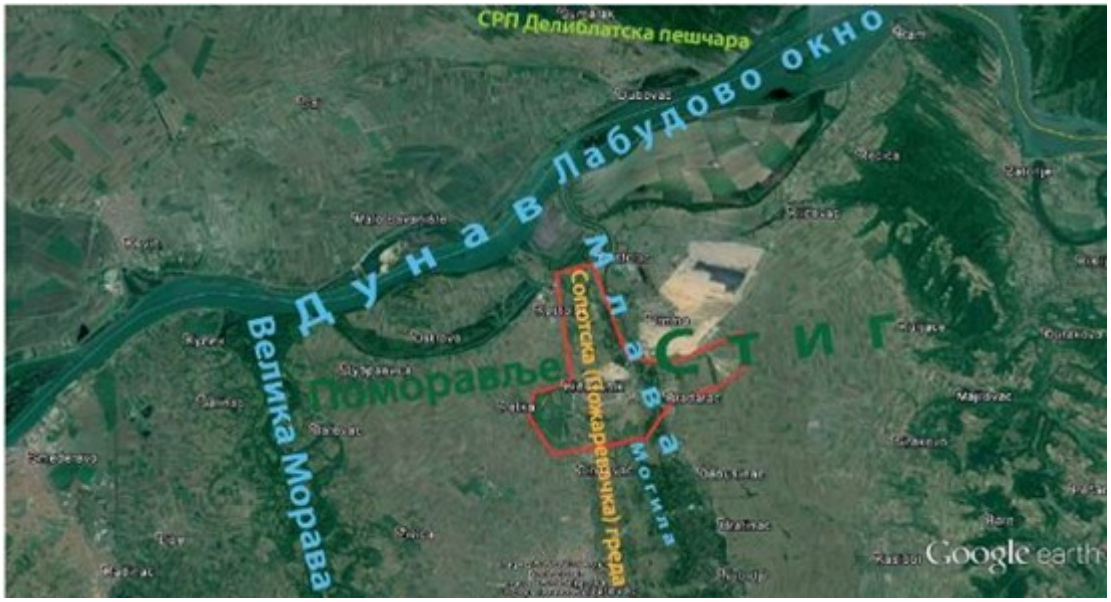


Figure 2.1. *Position of the planned Kostolac wind farm in relation to the wider environment*

All four locations of the wind power plant are mostly recultivated landfills of the Kostolac coal basin in the area of predominantly agricultural land and the zones of mining activities and thermal power complexes and settlements.

Figure 2.2. *View from the Sopotska greda at the location Kostolac on the staged anthropogenic relief of the closed surface mine Klenovnik and the lower plain region of Pomoravlje*

Locations of the planned wind farm, with an altitude range of approximately 100 to 135 m above sea level (in some places even more, with a maximum altitude of 174 m), dominate the

surrounding lowland peripanonian area of Pomoravlje and Stig (Figure 2.2) - alluvial plains of Velika Morava and Mlava, whose altitude is mainly in the range of 75 to 80 m. The natural border between these two plains, and drainage divide of their basins, is Sopotska (Pozarevacka) greda, in which zone most of the locations of the wind farm are located - Ćirikovac and Klenovnik. Location Drmno is located in the east, in the Stiska plain, and the location of Petka west, in Pomoravlje, but both in the immediate vicinity of Sopotska greda (about 3 km, or about 1.5 km). In comparison with the surrounding plains, the location of the wind farm, except for higher altitudes, is characterized by an extremely stratified relief, mainly as a result of anthropogenic activities (digging of ore and deposition of tailings).

In biogeographical terms, the site is located in the mezian province, characterized by the original forest vegetation and biomes of predominantly southern and submediterranean deciduous forests, and due to the presence of numerous water courses and stagnant waters and azonal vegetation of aquatic and humid habitats (Figure 2.3). However, in the greater part of the mezian province, the original vegetation and autochthonous ecosystems are highly reduced, fragmented and transformed by centuries of anthropogenic activities, mostly in agrobiocenosis, and these processes continue. This typical situation with the dominance of agrobiocenosis is characteristic for most of this area.

Figure 2.3. *Elements of preserved autochthonous forest, humid and aquatic habitats in the vicinity of the site are only present in the Mlava and Mogila rivers zone*

Figure 2.4. *Anthropogenic forest plantations and agrocenosis at the location of Petka*

Figure 2.5. *Mining and thermoenergetic infrastructure dominates the landscape - Thermal power plant Kostolac B and surface mine Drmno*

Location Drmno is located south of the surface mine Drmno, and east of vilage Bradarac. It covers an area of approximately 2.4 km^2. It is located on a tailings exteral landfill that is formed in the form of stages, slopes and cupped piles, of different widths and heights. The thickness of the fill layer is about 50 m, and the highest altitute of the terrain is about 141 m above sea level. Upon completion of taililngs deposit, the site was recultivated. In the immediate vicinity of the location there are no populated places.

The closest populated place is Bradarac, about 1.2 km from the border of the location, ie about 1.4 km from the position of the nearest wind generators. The largest part is covered with ruderal grassy vegetation, while the woody and shrubberous vegetation is present only in the form of smaller forests and shrubs, as well as individual trees and small groups (Figure 2.6), with only one larger fragment in the central part. Wood-shrubby vegetation, dense complex (mainly slugs and scrubs), is represented only on slopes and at the base.

At the location and in the immediate vicinity, there are no aquatic and humid habitats or agricultural land.

There are no buildings on the site, but there are several hunting feeders waiting in a rather deserted state. North of the location, at a distance of 400-500 m from the border and about 700 m from the position of the nearest wind turbine, there is a complex of facilities of the Administration of the Surface mine Drmno which have a certain, but not high, cryptic potential for bats.

Of all locations, this is characterized by the smallest, low, trophic and cryptic potential for both birds and bats.

Figure 2.6. *The central plateau of the Drmno site*

Location Ćirikovac is located on the alluvial plain of the river Mogila and partly on the Sopotska greda, west of the stream of the Mlava River, south of the surface mine Cirikovac, southeast of the settlement of Klenovnik and northeast of the settlement Ćirikovac. The location represents the external and part of the internal landfill of the surface mine Cirikovac. It covers an area of about 1.7 km^2. The thickness of the deposited layer is 10-40 m, and the altitude ranges 75-130 m above sea level.

Near the border of the location is Klenovnik settlement, but the positions of the nearest wind generators are about 1.4 km away from it, so the positions of the wind generators are closer to the Ćirikovac settlement - the closest to only 800 m. Significant part of the site is covered with low woody and shrubby vegetation, mostly shrike and forestry dominated by acacia and poplar, which is why the terrain is relatively unpredictable and difficult to pass, and peripheral are also agricultural areas and grassland vegetation.

A large part of the site occupies an ash landfill with a water surface whose marginal parts and the surrounding area are swamped at its lowest positions (Figure 2.7) - there are several zones

of flotant and swamp vegetation of the bulrush type, with thick bushy vegetation in the outer zones, which provides an abundance of cryptic conditions for numerous types of birds and other animals. On the southwestern border of the site, at a distance of 500-650 m from the position of the nearest wind turbine, there is a complex of facilities of the Administration of surface mine Cirikovac, which have a certain cryptic potential for bats and small songbirds, as well as individual trees within this complex.

Overall, this site has a moderate cryptic and trophic potential for birds, while for bats it has moderate trophic and low cryptic potential, but potential shelters are in close proximity.

Figure 2.7. *Ash landfill in the central part of the site Ćirikovac with swamped bordering and the surrounding area*

Location Petka (Figure 2.8) is located south-east of the settlement of the same name, southwest of the settlement of Klenovnik and the surface mine Cirikovac and northwest of the settlement Ćirikovac. It covers an area of approximately 2.64 km^2. The location is a tailings landfill from surface mine Cirikovac. The thickness of the deposit layer is about 60 m, and the highest altitude of the terrain is about 136 m above sea level.

The closest settlement is Klenovnik, which is located against the border of the location, but the position of the nearest wind turbine is about 750 m. Ćirikovac settlement is about 350 m from the border, and about 1.2 km from the position of the nearest wind turbine, while the Petka settlement is about 750 m away from the border of the location, and about 1 km from the position of the nearest wind turbine.

The site represents a successful example of land recultivation and is characterized by relatively developed forest vegetation, with agricultural areas - fields, meadows and lucerries. At the foot of the location towards Ćirikovac there are artificial stands of black pine, while the greater part of the footh and slopes of the site is covered with dense forests of acacia and poplar trees. Much of the site's plateau is covered with woody vegetation dominated by acacia and poplar trees, but mostly shrubbery of very thick structure (Figure 2.8), or young plantations.

At the site and in the immediate vicinity there are no aquatic and humid habitats. In the eastern part of the site there is a waste dumpsite. On the site there are no buildings, only a few game feeders. In the immediate vicinity, there are few individual facilities (for example, within the hothouse near the eastern border of the site), and at a distance of less than 500 m are the closest facilities to the settlements of Klenovnik and Ćirikovac, as well as the complex of the facilities of the surface mine Ćirikovac.

This location has relatively high cryptic and trophic potential for birds, while for bats it has high trophic, but low cryptic potential.

Figure 2.8. *The hard-to-pass shrubbery and scrub dominate the central plateau of the Petka site*

Location Klenovnik (Figure 2.9) is the only part that represents the natural part of the terrain, that is, the Sopotska greda, which on the western part borders with the closed Klenovnik surface mine, and in the far south with the closed surface of Ćirikovac. It covers an area of approximately 3.3 km^2. The terrain is extremely stratified with a highest altitute of about 174 m above sea level. At the very border of the location is the settlement of Stari Kostolac, from which the positions of the nearest wind turbines are about 500 m away, as well as from the settlement Kostolac, which is about 200 m away from the border. The settlement Klenovnik is about 400 m away from the border of the location, but about 1,1 km from the position of the nearest wind turbine. On the site there are grassy, bushy and woody vegetation, and in some parts, especially in the west, in the pockets of deposited tailings, a system of a larger number of smaller and several large stagnant waters with a whole complex of water, swamp and wetlands has been formed on the surface of almost 1 km^2. In the immediate vicinity of the site, at a distance of 0.5 to 2 km, there are complexes of aquatic and humid habitats of the Mlava, Dunavac and Danube rivers.

Although the area of the eastern slope of the Sopotska greda in this zone is categorized as a forest in the Spatial Plan, here, except in the narrow zone along the Mlava River, there is no forest, but fragments of shrubbery and scabs with very rare individual trees. There are also several loess sections that have a cryptic potential for certain species of birds, mainly on the edge of the mentioned depression with humid habitats (Figure 2.9), but also landslides that prevent their nesting in these places in the south of the site. There are landfills of municipal

waste along the northwestern and northeastern boundary of the site. and scabs with very rare individual trees. There are also several wood sections that have a cryptic potential for certain species of birds, mainly on the edge of the mentioned depression with wet habitats (Figure 2.9), but also landslides that prevent their nesting in these places in the south of the site. There are landfills of municipal waste along the northwestern and northeastern boundary of the site.

On the site there are 3 buildings of grange type and one cottage with low cryptic potential for bats. North of the site, the coal conveyor belt passes through with functional lighting. Some parts of this site have very high cryptic and trophic potential for birds, while for bats they have high trophic, but low cryptic potential.

Figure 2.9. *At the site Klenovnik are represented aquatic and humid habitats and loess sections*

In this area there are no protected natural areas or areas proposed for protection (Official Gazette of RS, No. 88/2010a), as well as elements of the ecological network of Serbia (Official Gazette of RS, No. 102/2010).

Figure 2.10. *View of Labudovo okno from the fortress Ramse*

However, in the immediate vicinity of the site, just 1.5 km northeast of the location, there is Labudovo okno (Figure 2.10) - a complex of river and aquatic habitats of the Danube in the Deliblatska pescara area. The largest part of this complex, that is, the Banat bottomland and the Danube River between Dubovac and Stara Palanka, Dubovački rit, Zilovo island and

Čibuklija and the confluence of the river Karas, is covered by the boundaries of the Special Nature Reserve (SNR) Deliblatska peščara (Official Gazette RS, No. 3/02, 81/08).

A wider area that includes the entire Danube stream from the Nera river confluence and the border with Romania to the confluence of Mlava river, including the area around the Nera river confluence, Zavojska island as well as the narrow coastal belt on the right bank of the Danube also has the status of a protected area protected by the Convention on Wetlands of international significance, especially as a marsh birds habitat (Official Gazette of SFRY, No. 9/1977), so-called Ramsar area (national code 3RS005, number 1655). This area is the most important breeding ground, wintering station and migratory station of birds of aquatic and humid habitats in Serbia and as such has the status of an international and national significant bird area (IBA - Important Bird Area) with the IBA code RS016IBA and as such it also enters the ecological network of Serbia (Official Gazette of the RS, No. 102/2010). With an even longer part of the Danube and a wider coastal belt on both sides, this area, i.e. Donje Podunavlje, is proposed for protection by the current Spatial Plan of the Republic of Serbia until 2020 (Official Gazette of the RS, No. 88/2010). Also, in this area in neighboring Romania, the Porcile de Fier National Park is connected. The south-western border of the SNR Deliblatska peščara is about 4 km from the site, and Deliblatska peščara itself is about 7 km on the other side of the Danube. This space was placed "... under protection as the largest European area built from the layers of Eolian sand with expressive forms of the dune relief and characteristic sandstone, steppe and forest ecosystems, with a unique mosaic of life communities and typical and specific representatives of flora and fauna. Many of them are natural rarities ... (strictly protected and protected species) ... significant according to international criteria ... "(Official Gazette of RS, No. 3/02, 81/08). Deliblatska peščara also has the IBA status, with the code RS015IBA, (Official Gazette RS, No. 102/2010). With 180 recorded bird species and 21 species of bats (data from the author of the Monitoring of the flying fauna), is one of the most important centers of diversity of bird fauna and bat fauna in Serbia. However, due to the separation from the location with the wide Danube valley zone and intensive anthropogenic activities of highly altered habitats, the possible impact of Deliblatska peščara proximity on the condition of the bat fauna on the site is negligible. Also, in the immediate vicinity of the site, at a distance of about 1.5 km north of the location, there is the Danube river, and about 7 km west is the Velika Morava River. The valleys of the Velika Morava and, in particular, the Danube are very important European migration corridors both of birds and bats during the spring and autumn period, due to which its streams with coastal belts are protected by law as ecological corridors of international importance and part of the ecological network of Serbia (Official Gazette RS, No. 102/2010). Directly along the boundary of the site, and partly within the boundaries, the valleys of the Mlava and Mogila rivers, which are characterized by relatively preserved aquatic, humid and indigenous forest habitats (Figure 2.11), which is very little in the wider area of the site.

Figure 2.11. *River Mlava near the location of the planned Kostolac wind farm*

2.2. Natural characteristics and conditions

2.2.1. Geomorphological characteristics of the terrain

The wider area of the Kostolac Mining and Energy Basin is plain, with a low level rugged foothills of teracce character. The plains of Stig, Podunavlje and Donje Pomoravlje and two ridges – Sopotska greda and Boževačka kosa stand out. The ridges extend north-south, almost parallel.

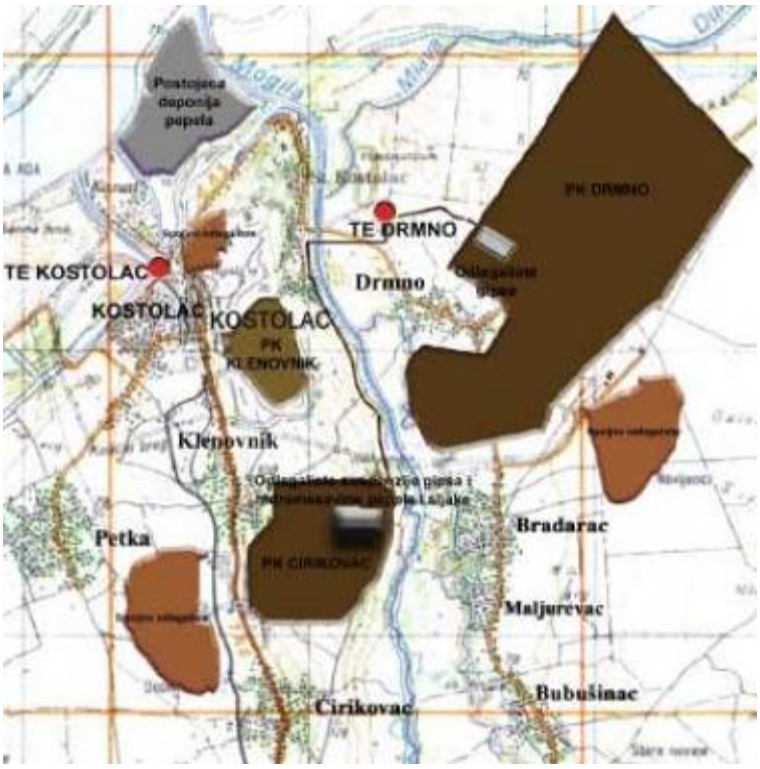
The western ridge (Sopotska greda) is lower and narrower, and it is located in the center of the subject area. Within this ridge are the heights of Leštar east of Kostolac (175 m) and Čačalica (200 m) on the eastern edge of the town of Požarevac.

The eastern ridge (Boževačka kosa) is located in the eastern part of the area and represents the eastern border of the Kostolac coal basin. From the village of Kličevac and Rečica it gradually rises and extends southward towards the wider foothill. At the ridges erosion cut (mainly in loess) more larger and smaller ravines ("prokop"), with subvertical sides of height and up to 20 m.

Plain Stig extends between the Boževačka kosa and Sopotska greda, which is around Mlava and Mogila rivers, in a zone with a width of up to 10 km, with terrain altitute roughly under 100 m. Over Klepec ridge it crosses into the Dunavac and Danube aluvion. To the west of the Sopotska greda is also a plain, with terrain altitutes below 100 m, which is known as Podunavlje along the Danube, and to the south as Pomoravlje (Figure 2.12).

***Figure 2.12**. Basic geomorphological elements in the exploration area (based on Google Earth view)*

The existing morphology of the terrain has been significantly changed due to the long-term surface exploitation of coal on surface mines (SM) "Drmno", SM "Klenovnik" and SM "Ćirikovac" with accompanying tailings landfills and large deposits of slag and ash from TPP Kostolac A and Kostolac B. The spatial position of the named, artificially formed, morphological forms is shown in Figure 2.13.



***Fifgure 2.13.** A schematic map of contemporary morphological shapes formed as a result of the operation of mines and thermal power plants*

It is similar with the changes in the relief in the originally flat Stig - south and east of Drmno (SM "Drmno", with coal overburden deposits). A view of the external deposit of coal overburden of SM Drmno is shown in Figure 2.14.

Figure 2.14. *View of the external coal overburden landfil within SM Drmno*

Velika Morava, and partly Mlava, were typical plain rivers with frequent changes in the riverbed, a large number of meanders, oxbow lakes and old riverberds. Modern morphology in this part of the terrain has been changed, as a consequence of the regulation of the riverbed and the exploitation of gravel.

2.2.2. Flora and fauna

The characteristics of the flora and fauna at the site and its surroundings were elaborated under point 2.1. Based on this, it can be concluded that the plant and animal world at the site is highly degraded and altered under the influence of anthropogenic factors. Former natural vegetation was replaced by agricultural crops and mining activities that created new ecological conditions. Natural vegetation was kept only on small surfaces.

In the wider surroundings of the area planned for the construction of a wind farm intensively cultivated fields dominate, i.e. agrobiocenosis, with predominantly one-year crops. In addition, populated areas with associated infrastructure, as well as surface mines, industrial-energy facilities and accompanying infrastructure (power lines, roads, etc.) contribute to the general ecosystem disturbance. The remains of the original ecosystems, primarily forest and aquatic, in the wider surroundings are present in the river valleys of the Mlava and Mogila. Locations where the installation of wind turbines is planned are spatially disturbed by surface exploitation and landfilling of tailings and ash. Because of mining works, the original vegetation was removed, and the ruderal (weed) vegetation developed spontaneously, which is, depending on the location, in different stages of succession. Woody and bushy vegetation is present sporadically, predominantly in the form of thicket, shrubbery and individual trees. They spontaneously covered the area, and partly they were planted for the purpose of recultivation.

The animal world does not differ much from that which is present in other plain parts of Vojvodina. The abundance of insects and other small animals provides rich food for frogs, snakes, who are the basis of the diet of numerous swamp and migratory birds (wild ducks, geese, mussels, gray and white herons and pheasants).

At the site of the wind farm there are no protected natural areas or areas proposed for protection (Official Gazette of RS, No. 88/2010), as well as the elements of the ecological network of Serbia (Official Gazette of the RS, No. 102/2010). The location of the temporary lighterage site is planned in the area of the Central area of the ecological network of Serbia "Deliblatska peščara", on the right bank of the Mlava/Mogila near the confluence of the Danube. The subject area is included in the named central area as an important bird area - IBA (Important Bird Area).

2.2.2.1. Butterflies fauna

Monitoring of the daily butterflies in the area planned for the construction of the wind farm "Kostolac" in 2015 and 2016 recorded total 53 species of daily butterflies. Part of the data was collected during bird monitoring, and targeted field visits for butterfly monitoring were evenly distributed with a 10 day interval between 2 consecutive field visits (a total of 10 field days). Butterflies were captured by an entomological net and identified using a key for species identification, while the disputable individuals are photographed by a digital camera and subsequently identified. During each visit of the subject site, all planned micro-location of the pillars were observed in the immediate vicinity. In Table 2.1. is a list of recorded types of day butterflies. The number of individuals of these species varied and generally increased from spring to summer, and decreased from August.

Table 2.1. Recorded types of daily butterflies at the subject site by IUCN categorization

Scientific name of the species	Common name	IUCN categorization
Family Hesperiidae	**Skelari, vetropiri**	
Erynnis tages	Tamni skelar	LC – least concern
Spialia orbifer	Dinjicina hesperida	LC - least concern
Pyrgus malvae	Slezova hesperida	LC - least concern
Thymelicus lineola	Smeđi skelar	LC - least concern
Hesperia comma	Livadski skelar	LC - least concern
Ochlodes venata	Riđi skelar	LC - least concern
Family Papilionidae	**Jedrilci**	
Zerynthia polyxena	Uskršnji leptir	LC - least concern
Parnassius mnemosyne	Mnemozine	LC - least concern
Iphiclides podalirius	Vetrilo, jedrilac	LC - least concern
Papilio machaon	Lastin rep	LC - least concern
Family Pieridae	**Belci**	
Leptidea sinapsis	Gorušičin belac	LC - least concern
Anthocharis cardamines	Zorica	LC - least concern
Aporia crataegi	Glogovnjak	LC - least concern
Pieris brassicae	Veliki kupusar	LC - least concern
Pieris rapae	Mali kupusar	LC - least concern
Pieris napi	Žiličasti kupusar	LC - least concern
Colias crocea	Šafranovac	LC - least concern
Gonepteryx rhamni	Žutac, limunovac	LC - least concern

Scientific name of the species	Common name	IUCN categorization
Family Lycaenidae	**Plavci**	
Lycaena virgaureae	Dukat	LC - least concern
Lycaena alciphron	Kiseljakov dukat	NT – near threatened
Satyrium acaciae	Mali repkar	LC - least concern
Celastrina argiolus	Krkovin plavac	LC - least concern
Scolitantides orion	Žednjakov plavac	NT - near threatened
Plebeius argus	Stooki plavac	LC - least concern
Polyommatus daphnis	Krzavi plavac	LC - least concern
Polyommatus bellargus	Potkovičar	LC - least concern
Polyommatus coridon	Srebrnkasti plavac	LC - least concern
Family Nymphalidae	**Šarenci**	
Argynnis paphia	Gospođak	LC - least concern
Argynnis aglaja	Velika sedefica	LC - least concern
Argynnis adippe	LJubičina sedefica	LC - least concern
Issoria lathonia	Mala sedefica	LC - least concern
Brenthis daphne	Karirana sedefica	LC - least concern
Brenthis hecate	Beloglavičar	LC - least concern
Vanessa atalanta	Admiral, lepotić	LC - least concern
Vanessa cardui	Stričkovac, lisica	LC - least concern
Aglais io	Paunovac	LC - least concern
Aglais urticae	Koprivar	LC - least concern
Polygonia c- album	Riđa sedefica	LC - least concern
Arachnia levana	Šumska riđa	LC - least concern
Nymphalis antiopa	Mrtvački plašt	LC - least concern
Nymphalis polychloros	Veliki koprivar	VU - vulnerable
Melitaea cinxia	Obični šarenac	LC - least concern
Melitaea aurelia	Zlatni šarenac	LC - least concern
Limenitis populi	Veliki topolnjak	LC - least concern
Neptis sappho	Grahorovac	LC - least concern
Apatura ilia	Mali prelivac	LC - least concern
Apatura iris	Talasnjak	LC - least concern
Lasiommata megera	Zidni okaš	LC - least concern
Lasiommata maera	Veliki okaš	LC - least concern
Coenonympha pamphilus	Mali satir	LC - least concern
Pyronia tithonus	Vratar	LC - least concern
Maniola jurtina	Volovsko oko	LC - least concern
Melanargia galathea	Šah- tabla	LC - least concern

From the family plavci (Lycaenidae) at the site, two species were identified, which according to the IUCN classification were marked as almost endangered. These two species were recorded in a small number at the location of the Cirikovac-Petka landfill, as well as in the area near the ash deposit on the Klenovnik locality. At these sites, but not near microlocation of wind turbines, there are plant breeders of these two species, *Rumex acetosa* and *Sedum sp.* These species are local, but widespread butterfly species in the area of Serbia, south of the Sava and Danube. In eastern Serbia, these two species are recorded in many localities. One vulnerable species according to the IUCN classification was recorded from the *Nymphalidae* family. This is a veliki koprivar (*Nymphalis polychloros*) recorded only at the site of the Drmno landfill. Nutritious caterpillar plants of this polyphagous species are numerous representatives of the genera *Ulmus, Salix, Prunus, Malus, Populus, Sorbus, Crataegus*, which are present at all subject locations within the future wind farm "Kostolac". The population of this type of butterflies is stable in Serbia, and this species is widespread.

Below, in Table 2.2 the list is given with recorded species that are protected by the national legislation, i.e. according to the Law on Nature Protection, i.e. Rulebook on the designation and protection of strictly protected and protected wild species of plants, animals and fungi (Official Gazette of RS, No. 5/2010 and 47/2011).

Table 2.2. Registered protected species of butterflies according to the regulations of Serbia

Scientific name of the species	Common name	National legislation
Family Papilionidae	**Jedrilci**	
Zerynthia polyxena	Uskršnji leptir	strictly protected species
Parnassius mnemosyne	Mnemozine	strictly protected species
Papilio machaon	Lastin rep	strictly protected species
Family Pieridae	**Belci**	
Pieris brassicae	Veliki kupusar	strictly protected species
Family Lycaenidae	**Plavci**	
Satyrium acaciae	Mali repkar	strictly protected species
Family Nymphalidae	**Šarenci**	
Nymphalis antiopa	Mrtvački plašt	strictly protected species
Limenitis populi	Veliki topolnjak	strictly protected species
Apatura ilia	Mali prelivac	strictly protected species
Apatura iris	Talasnjak	strictly protected species

Out of 53 total recorded species of daily butterflies, 10 species are strictly protected by domestic laws (Table 2). It is interesting that none of the 10 recorded strictly protected species is endangered according to the IUCN classification. All recorded strictly protected species at the site are relatively rare. They were recorded only few times, except for the veliki kupusar and lastin rep that has been found on several occasions at almost all micro sites. Species of veliki topolnjak, mali prelivac and talasnjak are related to the presence of the river nearby and were not found on the micro-locations of future wind turbines. In the immediate vicinity of the potential wind farm "Kostolac" there are no selected areas for daily butterflies. The nearest *PBA* (*Protected Butterfly Area*) is the *PBA03* "Deliblatska peščara", which is about 10 km from the nearest wind turbine, separated by the river Danube as a barrier. The second nearest *PBA* area is *PBA05* «Djerdap», which is about 30 km away. According to previous research, 88 species of daily butterflies were recorded in the selected area *PBA03* (Deliblatska peščara) (Jakšić 2008). This selected area hosts nationally significant populations of the following butterflies species:

- *Zerynthia polyxena*
- *Parnassius mnemosyne*
- *Colias myrmidone*
- *Lycaena dispar*
- *Glaucopsyche alexis*

According to previous research, 104 species of daily butterflies were recorded in the selected area *PBA05* (Djerdap) (Jakšić 2008). This selected area hosts nationally significant populations of the following butterflies species:

- *Thymelicus acteon*
- *Lycaena dispar*

- *Scolitantides orion*
- *Nymphalis xanthomelas*
- *Nymphalis vaualbum*
- *Euphydryas maturna*
- *Melitaea aurelia*
- *Erebia medusa*

2.2.3. Climate characteristics

The area of the Drmno and Kostolac mining and energy basins, as part of the southern periphery of the Pannonian Basin, is characterized by a moderate continental climate that emphasizes steppe-continental climatic influences of neighbouring Banat. The characteristics of this climate are colder winters and warmer summers. The main source of data for the climate analysis are the long-term measurements carried out by the Republic Hydrometeorological Institute of Serbia at the Main Weather Station Veliko Gradiste, 27 km east of the Thermal Power Plant, which is climatologically representative for the subject area. The text below gives the average monthly and annual temperatures and relative humidity, monthly and annual atmospheric rainfall for the period from 1983 to 2012 and the data of wind measurements for the location of the planned wind farm Kostolac.

Air temperature

The mean annual air temperature is 11.4 °C, and the mean annual amplitude of air temperature fluctuations is 21.7 °C. The coldest month is January with a mean monthly temperature of 0.3 °C, and the hottest month is July with a mean temperature of 22.1 °C. According to the diagram (Figure 2.15.), the air temperature from January to July is steadily increasing and from August to January it is in decline.

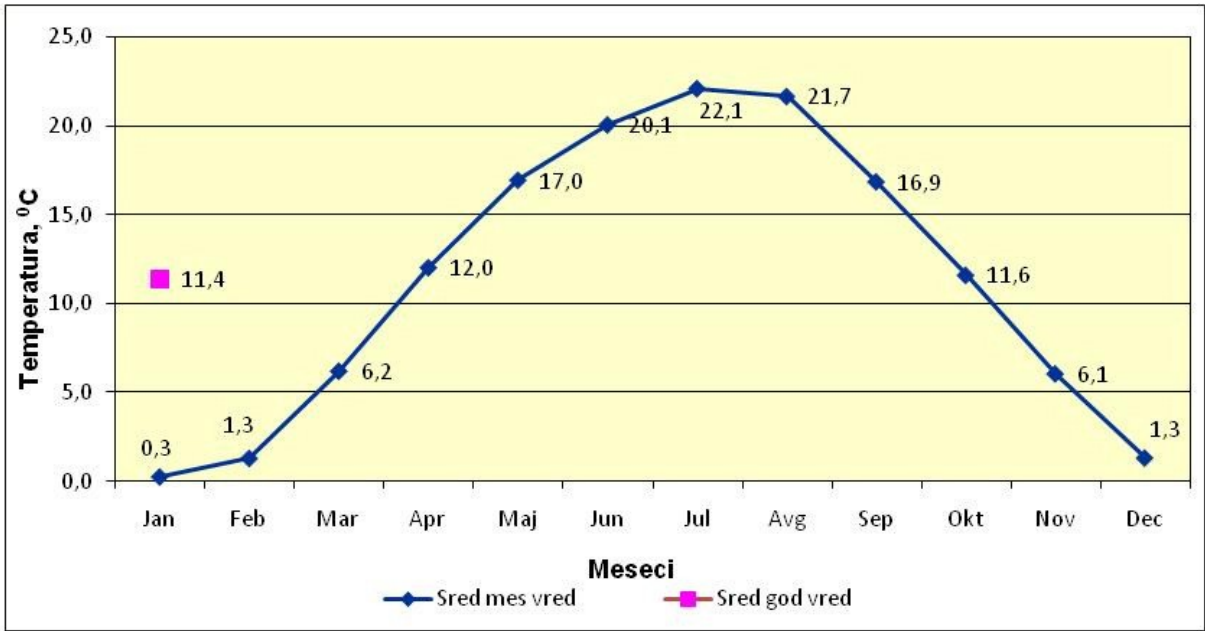


Figure 2.15. *Average monthly and average annual air temperature for the period 1983-2012 (meteorological station Veliko Gradiste)*

The average monthly spring temperature is slightly below 11 °C, while the autumn is about 15 °C. Temperatures below 0 °C occur between September and May, and between November and March, the average monthly minimum temperature is around -8 °C. The first frosts occur in mid-October, and the last in early April.

Humidity and fog

Relative humidity (expressed in %) represents the ratio between the water vapor content in the air at a certain temperature and the maximum amount of water vapor that the air could receive at the same temperature when it is transferred to the saturated state. The highest values of relative air humidity are in the autumn and winter months and range in the range of 68-85%, and are the lowest in the summer, in the range of 69-71%. The average relative humidity in the ground layers is 75%, so this area is considered to be moderately moist. Comparing the annual changes in relative humidity and air temperature, it is noted that they are inverted proportional.

The number of fog days, which lasts longer than one day, is 19 on average. For more than two days, fog appears on average once every five years. Fog most often occurs in autumn.

Precipitation

In the annual distribution of precipitation, two maximums and two minimums are clearly expressed. The primary maximum occurs in June and the secondary one in September, while the primary minimum occurs in March and the second in November. The average annual precipitation for MS Veliko Gradiste is 641 mm. Characteristics of the climate are also very dry winters with little snowfall. The summer period is characterized by short term and shallow rain. The average number of days in the year with precipitation is 134. The land is on average covered by snow for about 35 days a year, with a height of snow cover from 15 to 30 cm, and a maximum of 60-100 cm.

Wind

Measurement of wind parameters is performed by placing the meteorological masts with measuring instruments which record the data in the so-called. logger and which, other than storage in their own memory, are sent via the mobile telephone network to the e-mail. The data are recorded and sent at time intervals of 10 minutes and based on them, estimates of the wind potential and software simulation of the wind farm production. The data obtained by measurement are the so-called. raw data, that is, they must be analyzed and processed before use in further processes.

On the basis of available data on wind measurements delivered by PE EPS, data from 3 measuring points were obtained: Klenovnik, Drmno and Petka (Figure 2.16).

Legend:	
	The boundary of the zone of interest for instalation of wind farm

***Figure 2.16**. Existing meteorological masts - shown on the Google Earth map*

Comparative review of the frequencies roses and speeds for all three locations are given below.

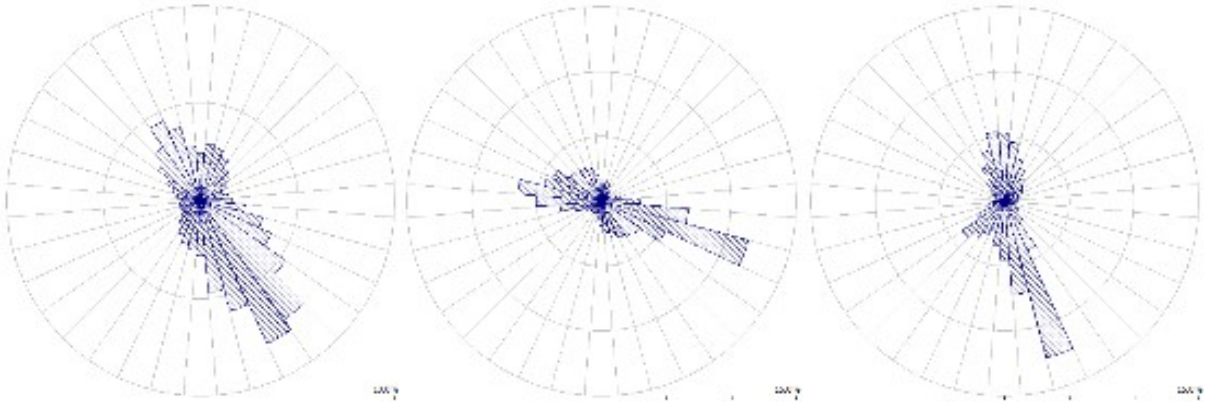


***Figure 2.17.** Frequency roses for locations Drmno, Klenovnik and Petka (from right to left)*

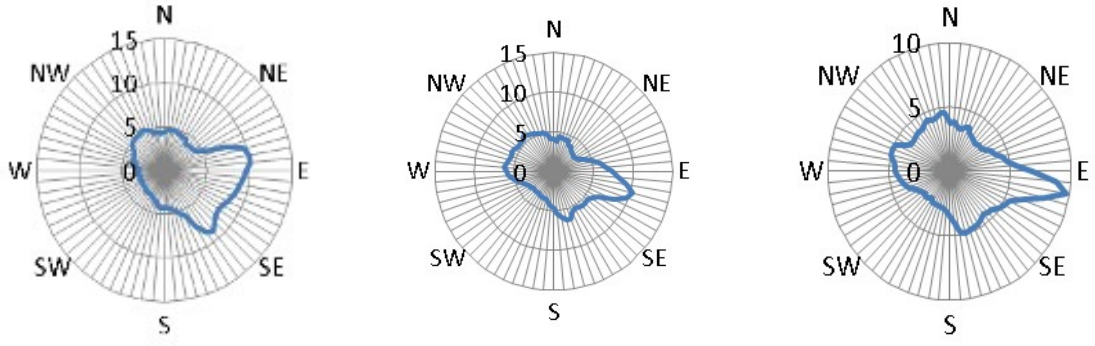


***Figure 2.18.** Speed roses for locations Drmno, Klenovnik and Petka (from right to left)*

The correlation between the measured and predicted mean wind speeds, obtained on the basis of the processed data, is shown in the following graph.

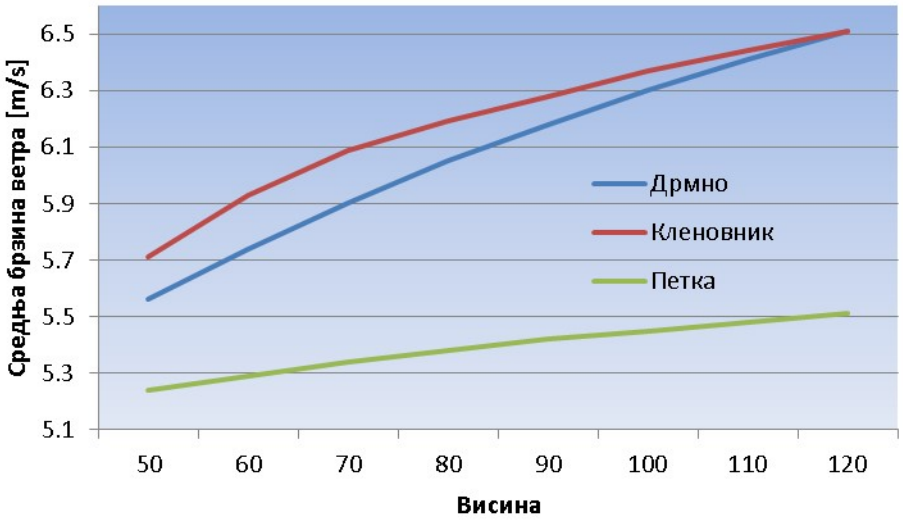
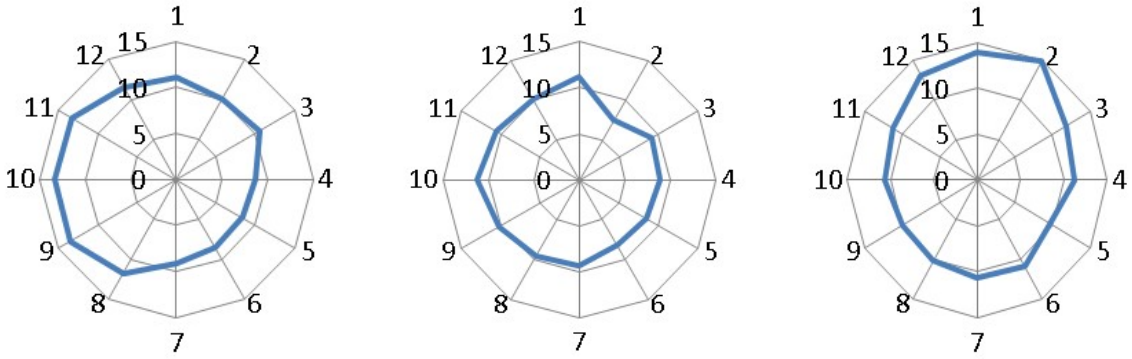


Figure 2.19. *Graph of mean wind speeds at different heights for all locations*

The display of the intensity of turbulence by sectors is given comparatively for all three locations (Figure 2.20).



Location:	Drmno	Klenovnik	Petka
Medium ambient turbulence intensity [%]	10,80	9,54	11,54

Figure 2.20. *Graphic and tabular display of the turbulence intensity - Drmno (60m), Klenovnik (60m) and Friday (50m)*

In addition to the elaborated data, there is also an anemometer at the Drmno location, at height of 120 meters, from which data on air currents that are important for estimating the production of the planned Kostolac wind farm are also collected.

2.2.4. Pedological characteristics

From the pedological point of view, the most widespread types of soil in the wider area of the Kostolac basin are alluvial marsh chernozem, chernozem, cambisol, vertisol and metamorphic vertisol, which belong to the group of climatic and topogenic soils. For the area of the subject location is characteristic of the distribution of vertisol and metamorphic vertisol.

Regarding the location of the planned Kostolac wind farm, it is foreseen in an area that is completely anthropogenically changed due to mining activities. This location is in a pedological sense drastically changed in relation to the former natural charateristics and is dominated by the so-called technogenic land originated mainly by deposited tailings from the surface mines, without significant prudential qualities (Figure 2.21.)

Figure 2.21. *Map of the wider area of the Kostolac coal basin (Source: Google Earth)*

2.2.5. Seismic characteristics

Based on the seismic map of Serbia (Figure 2.22), this area belongs to the seismic intensity of the 7th degree MCS scale (Mercall-Cancani-Sierberg scale). The following description of manifestations corresponds to this degree: difficulty in standing; breaking of the furniture; minor damage to objects well designed and constructed; small to medium damage on solidly built building structures; significant damage to poorly built or inadequately designed facilities; some chimneys broken; noticeable to persons while driving motor vehicles.

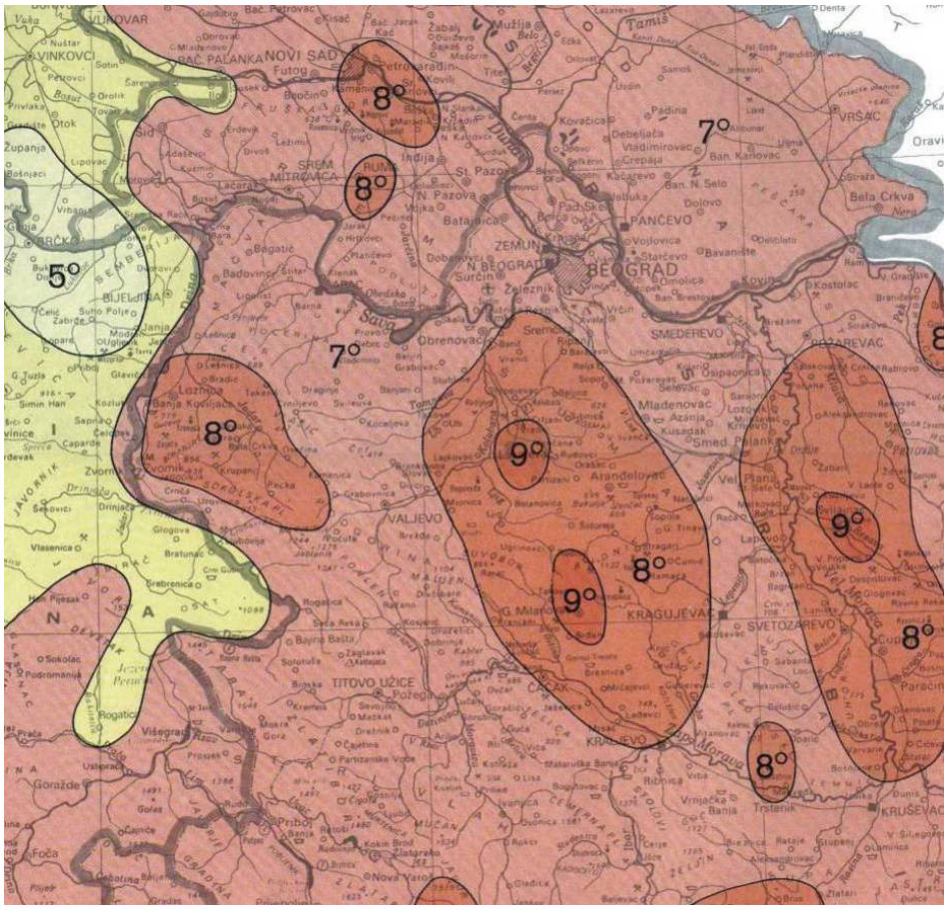


Figure 2.22. *Seismological map of Serbia (Regional Map of the Union for Seismology of the SFRY, Belgrade, 1987)*

For a detailed analysis of the local soil response to seismic activity, a detailed Seismic micro-regulation of the terrain at the scope of the Project has been done to define project seismic parameters in accordance with the positive regulations of Serbia and Eurocode 8-1. The analyzes were carried out with the aim of defining the parameters of the horizontal elastic spectrum of the local soil response, the corresponding time histories of acceleration and deformable soil properties compatible with the seismic effect on the four microlocation WF Kostolac: Drmno, Klenovnik, Ćirikovac and Petka. The protection of human life as a basic imperative in counter-seizmic construction as well as the importance of certain facilities in the functioning of the system of human protection is reflected in the category of importance of objects expressed as a coefficient of significance which indirectly reduces the probability of overcoming and up to 5% in 50 years, that is, increases the period with a risk of 10% in which damage or collapse can occur at 1000 years or more.

The objects that are the subject of designing at the site of wind farm in Kostolac can be classified into the following categories:

- I category objects- wind generators objects (industrial buildings with expensive equipment) with a coefficient Ko=1.5,
- II category – industrial buildings that are not clasified as I category (substations, traffic and other objects) with a coefficient Ko=1.0.

For the location of the facilities of the wind farm in Kostolac – ***locality Drmno*** for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T_{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

The liquefaction resistance of the local soil is defined using the results of geomechanical investigations, mainly CPT tests. CPT field tests in their essence, represent a continual representation of the change of soil properties along the depth of the geotechnical profile. Altogether 7 CPT tests were performed at Drmno site. By analyzing the data of all 7 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Drmno is low. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac-locality Drmno showed that there is no potential for the occurrence of liquefaction. The results of an independent analysis of laboratory and CPT tests are consistent with the existence of conditions for the initiation of liquefaction and, according to the probability of events and the index of the liquefaction potential, the danger is defined as "unlikely".

For the location of the facilities of the wind farm in Kostolac – ***locality Klenovnik*** for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T_{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

Altogether 6 CPT tests were performed at Klenovnik site. By analyzing the data of all 6 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Klenovnik is low. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac-locality Klenovnik showed that there is no potential for the occurrence of liquefaction. The results of an independent analysis of laboratory and CPT tests are consistent with the existence of conditions for the initiation of liquefaction and, according to the probability of events and the index of the liquefaction potential, the danger is defined as "unlikely".

For the location of the facilities of the wind farm in Kostolac – ***locality Ćirikovac*** for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T_{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type C. The type of spectrum is I based on magnitude of the competent earthquake.

A total of 4 CPT tests were performed at the Ćirikovac site. By analyzing the data of all 4 CPT experiment in 3 cases of very low value of the index of the liquefaction potential were obtained and the high potential at the WG 11 location, and the risk of its occurrence at the location of wind farm Kostolac, the Ćirikovac locality is generally low. The results of an independent analysis of laboratory and CPT test data are inconsistent. One of the reasons is the assumption that the level of groundwater is on the surface of the terrain and the other cause of this certainly lies in the sampling method, continuous and discrete. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac- the Ćirikovac locality showed that there is a potential for the occurrence of liquefaction in the existence of conditions for the initiation of liquefaction, and the danger is defined as "very likely" according to the probability of events and the index of the liquefaction potential. Analysis of the liquefaction potential for the location of the wind turbine at the location of Ćirikovac has shown that there is a high probability of ~ 13% for the occurrence of liquefaction. The analysis shows that the last 8 meters to the surface of the terrain are the key to the occurrence of liquefaction, and by the appropriate method of foundation the expected effects of liquefaction on vertical subsidence can be significantly reduced.

For the location of the facilities of the wind farm in Kostolac – ***locality Petka*** for representative model: for the geodynamic model was defined the seismic hazard at adopted area of local soil according to Serbian standard and 475g according to EN1998-1:

T_{NCR}	PGA (g)
95	0.06
500(475)	0.08
975	0.10

The categorization of objects was carried out in accordance with the Rulebook and standards EN 1998-1 and SRPS EN 1998-6. The categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

Altogether 3 CPT tests were performed at Petka site. By analyzing the data of all 3 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Petka is low. The results of an independent analysis of laboratory and CPT test data are inconsistent. Cause of this certainly lies in the sampling method, continuous and discrete. Analysis of the conditions for the

occurrence of liquefaction at the site of wind farm Kostolac- the Petka locality showed that there is a potential for the occurrence of liquefaction in the existence of conditions for the initiation of liquefaction, and the danger is defined as "very likely" according to the probability of events and the index of the liquefaction potential. Analysis of the liquefaction potential for the location of the wind turbine 9 at the location of Petka has shown that there is a high probability of ~ 19% for the occurrence of liquefaction. The analysis shows that the last 4 meters to the surface of the terrain are the key to the occurrence of liquefaction, and by the appropriate method of foundation the expected effects of liquefaction on vertical subsidence can be significantly reduced.

The control calculation benchmark for all four micro-locations showed that the proposed parameters of the specific spectrum for the location Kostolac containing the expected spectral acceleration as for distant as well as maximum local earthquakes.

Detailed data on the liquefaction were elaborated in the geotechnical study especially for all four sites of the Kostolac wind farm.

2.2.6. Hydrological characteristics

The hydrographic network is very developed. The main feature of the hydrographic network of the exploration area is the Danube River with the Dunavac, and the tributaries Velika Morava and Mlava (Figure 2.23).

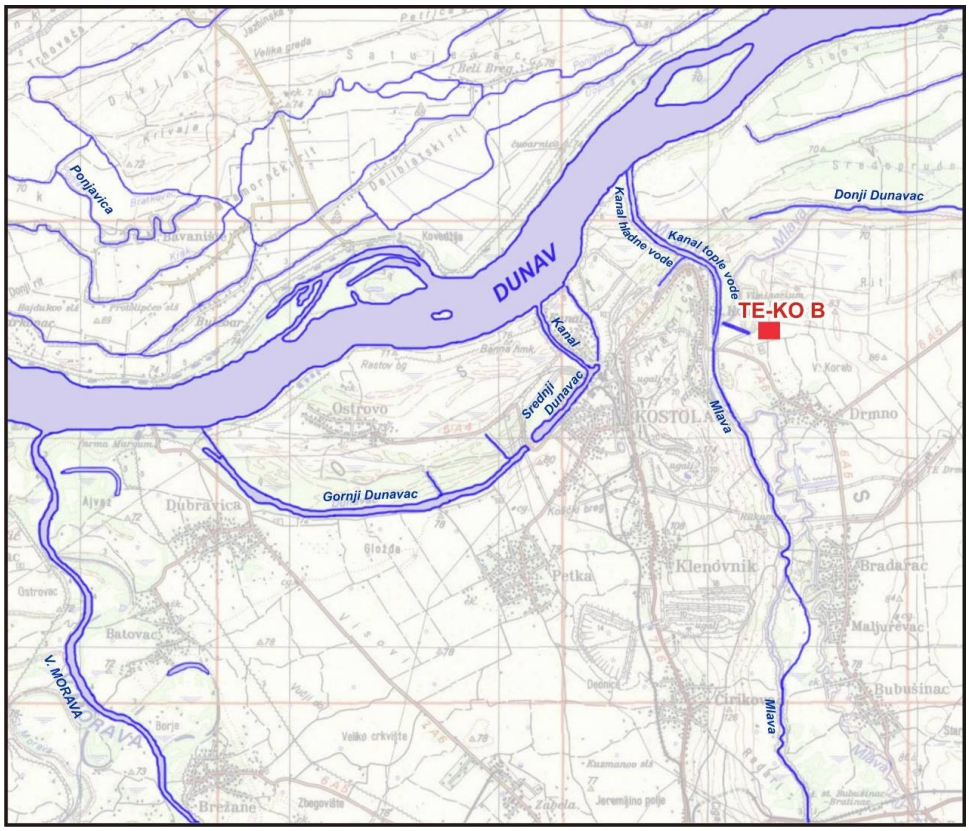


Figure 2.23. *A hydrographic map of a wider exploration area*

The Danube is about 1200 m wide in the Kostolac area. There are several islands on it: Dubovska ada, Stojkova Ada, Žilovo, Čibuklija, Zavojska. The depth of the Danube in the river bed varies from 7 to 17 m. With the construction of the HPP "Djerdap" the level of the

Danube is raised, the depth is larger and the altitute of the level varies from 69.5 to 70 m. The average annual flow of the Danube is 5.490 cubic meters per second, with a specific yield of 10.4 liters per second per square kilometer. The right bank of the Danube is low and is often flooded. Due to the raising of the Danube level after the construction of the HPP "Djerdap", a system of embankments was built to protect Danube banks from high waters and floods.

Figure 2.24. *Hydrographic network of the wider area of the Kostolac wind farm (Source: Google Earth)*

The Dunavac (or Little Danube) was previously the right outflow of the Danube, around an island 21 km long and 4 km wide, where the village Ostrovo is located in the upstream part (north of Dubravica and Petka). In recent literature, the Little Danube is called Dunavac and is divided into Upper, Middle and Lower (Figure 2.24). Upper Dunavac (Pecanski Dunavac), 8 km long, is separated from the Danube and Middle Dunavac by embankments. The water regime in the Upper Dunavac is regulated by a pumping station and is maintained at 67.20 m. Middle Dunavac, in the length of 1700 m, is connected with the Channel (also 1700 m long) with the Danube from which its water level depends. Figure 2.53 shows Lower Dunavac and Middle Dunavac. Lower Dunavac, from the confluence of the Mlava River to Klicevac, 12 km long, is practically drained at lower water level. Its riverbed serves as a recipient of surface and groundwater from the surrounding terrain, and the level is regulated by the pumping station at Ram.

Mlava is formed from the Vrelo in the area of Žagubica. Downstream from Petrovac at higher water levels it was waterflow. East of Pozarevac from Mlava separates the left outflow of Orlovača, which is downstream called Mogila. Today Mlava is regulated from Petrovac downstream. With the new riverbed was introduced in the Danube near the Kostolac B thermal power plant. On the right bank there is a protective embankment that is integrated into the Danube protection system. Mlava under the Petrovac is degraded river of altered organoleptic properties with increased content of organic matter. The oxygen regime is corrupted due to the heavy load of the sewage system and the water corresponds to the 4th class of quality. The Mlava basin mostly belongs to the mountain area that is characterized by watercourses with relatively large longitudinal falls. In the basin area upstream from the Gornjak, all watercourses are characterized by very large differences between extremely large

and small waters, and on some watercourses, the ratio Q max and Q min reaches a value of 1000. On the lowest profile (Mogila), which covers 1749 km^2 or 96% of the territory of the Mlava River basin, the mean annual flow is 12.9 m^3/s.

Cold and hot water channels - TEKO-B uses large amounts of cooling water from the Danube (2 x 25.650 m^3/h) per block, which is 102,600 m^3/h (Figure 2.25).

Figure 2.25. *Cold water channel*

After cooling, this water is discharged into the Mlava river through the piping system (return cooling water channel) (Figure 2.25). These waters are thermally burdened. In the winter months due to the elevated temperature of water, this part of Mlava at the confluence of the Danube becomes a habitat for many fish species.

Velika Morava flows into the Danube near the village of Dubravica. A typical flatland river, prior to regulation with frequent change of the riverbed, a large number of meander and oxbow lakes. At higher water levels it becomes fast and in the Danube brings in large quantities of sludge, sand and gravel. Due to irregular flow and frequent flooding of the fertile plain, the regulation of the riverbed was carried out. Velika Morava River is distinguished by the surface of a 37,444 km^2 basin, an average annual flow of 257 m^3/s and a specific outflow of up to 6.7 l /s/km^2. The smallest registered flow rate is 25 m^3/s and a maximum of 2,350 m^3/s. Stream of Velika Morava has a serious problem of sedimentation (approx. $8{,}735 \times 10^3$ tons per year).

2.3. Overview of species of birds and bats of the study area and surroundings

On the basis of one-year observations of ornithofauna and hiropterofauna in the area planned for the construction of the wind farm at the site Kostolac, concrete data on the number and types of flying fauna in the wind farm area and in the wider surroundings were obtained.

2.3.1. Results of one-year ornithofauna monitoring

In the entire research area from December 2014 to November 2015, the monitoring carried out in total showed the presence of representatives of 120 species of birds (Tables 2.1 and

2.2). Representatives of many of the recorded species were present in extremely small numbers. Of the listed number of species, 17 are classified as target species in terms of their national and international importance and status of conservation and protection, as well as on the basis of susceptibility to the risk of collision with wind turbines due to their specific bionomy, behavior, route and height of flying and eventual disturbance of habitat by building wind turbine infrastructure.

Table 2.1 List of all types of birds whose members were recorded (mark +) at locations of the potential wind farm Kostolac and observation points.

No.	Species	Nesting	OP1	OP2	0P3	OP4	OP5	OP6	OP7
1	***Cygnus olor***				+				
2	*Anas platyrhynchos*	c	+						
3	*Coturnix coturnix*	c	+	+	+	+	+		+
4	*Phasianus colchicus*	c	+	+	+	+	+		+
5	*Perdix perdix*	c		+		+	+		+
6	*Tachybaptus ruficollis*	c				+			
7	*Phalacrocorax carbo*		+	+	+	+			
8	***Casmerodius albus***		+						
9	*Ardea cinerea*		+	+	+	+			+
10	***Ciconia nigra***						+		
11	***Ciconia ciconia***		+	+	+				+
12	***Pernis apivorus***			+					
13	***Circus cyaneus***		+		+	+	+		
14	***Circus pygargus***			+					
15	***Circus aeruginosus***		+	+	+	+	+	+	
16	***Accipiter gentilis***	**p**		+					+
17	***Accipiter nisus***	**p**	+		+	+	+	+	+
18	***Haliaeetus albicilla***								+
19	***Buteo buteo***	**c**	+	+	+	+	+	+	+
20	***Falco columbarius***				+				
21	***Falco vespertinus***						+		
22	***Falco subbuteo***	**p**	+	+	+	+		+	
23	***Falco tinnunculus***	**c**	+	+	+	+	+		+
24	***Grus grus***		+						
25	*Crex crex*	c				+			
26	*Gallinula chloropus*	c				+			
27	*Larus ridibundus*		+	+	+	+		+	
28	*Larus canus*					+			
29	*Larus michahellis*		+	+	+	+	+	+	
30	*Columba livia f. domestica*	c	+	+	+	+		+	

No.	Species	Nesting	OP1	OP2	0P3	OP4	OP5	OP6	OP7
31	*Columba palumbus*	c	+	+	+		+		+
32	*Streptopelia decaocto*	c	+	+	+	+	+		
33	*Streptopelia turtur*	c	+	+	+	+	+	+	+
34	*Cuculus canorus*	c	+	+		+			+
35	*Athene noctua*	c				+			
36	*Otus scops*	p		+					
37	*Asio otus*	c		+*	+*		+*		+*
38	*Strix aluco*	p		+*		+*			+*
39	*Caprimulgus europaeus*				+*				
40	*Apus apus*		+	+	+	+	+		
41	*M erops apiaster*	c	+	+	+	+	+	+	+
42	*Upupa epops*	c	+		+	+		+	
43	*Jynx torquilla*	c	+						+
44	*Picus viridis*	p	+	+				+	+
45	*Dendrocopos major*	c	+	+	+	+	+	+	+
46	*Dendrocopos medius*	c	+						+
47	*Dryobates minor*	c	+			+	+	+	+
48	*Oriolus oriolus*	c	+	+		+		+	+
49	*Lanius minor*	p				+	+		+
50	*Lanius collurio*	c	+	+	+	+	+	+	+
51	*Lanius excubitor*		+	+	+	+	+	+	+
52	*Pica pica*	c	+	+	+	+	+	+	+
53	*Garrulus glandarius*	p	+	+	+	+		+	+
54	*Coloeus monedula*		+		+	+			
55	*Corvus frugilegus*		+			+	+		+
56	*Corvus corone/cornix*	c	+	+	+	+	+	+	+
57	*Corvus corax*	c	+	+	+	+		+	
58	*Parus caeruleus*	c	+	+	+	+	+	+	+
59	*Parus major*	c	+	+	+	+	+	+	+
60	*Parus palustris*	c	+	+				+	+
61	*Lullula arborea*	c	+	+	+	+	+	+	+
62	*Alauda arvensis*	c		+	+	+	+		+
63	*Riparia riparia*	c	+	+	+	+		+	+
64	*Hirundo rustica*	p	+	+	+	+	+	+	+
65	*Delichon urbicum*	p	+	+	+	+		+	+
66	*Aegithalos caudatus*	c	+	+	+		+	+	+

No.	Species	Nesting	OP1	OP2	0P3	OP4	OP5	OP6	OP7
67	*Phylloscopus sibilatrix*		+						
68	*Phylloscopus trochilus*		+	+	+	+	+	+	+
69	*Phylloscopus collybita*		+	+	+	+	+	+	+
70	*Acrocephalus arundinaceus*	c	+			+			+
71	*Hippolais icterina*			+					
72	*Sylvia atricapilla*	c	+	+	+	+	+	+	+
73	*Sylvia borin*				+			+	+
74	*Sylvia nisoria*	c	+	+	+	+		+	+
75	*Sylvia curruca*	p	+	+	+	+	+	+	+
76	*Sylvia communis*	c	+	+	+	+	+	+	+
77	*Regulus regulus*		+					+	
78	*Sitta europaea*	c	+	+					
79	*Certhia brachydactyla*	p		+				+	
80	*Troglodytes troglodytes*	c	+	+					+
81	*Sturnus vulgaris*	c	+	+	+	+	+	+	+
82	*Turdus viscivorus*		+	+	+	+	+		+
83	*Turdus merula*	c	+	+	+	+		+	+
84	*Turdus pilaris*		+	+	+	+	+		+
85	*Turdus philomelos*	c	+	+	+	+	+	+	+
86	*Muscicapa striata*	p	+	+				+	+
87	*Ficedula hypoleuca*		+						+
88	*Ficedula albicollis*		+	+					+
89	*Saxicola rubetra*		+	+	+		+		+
90	*Saxicola rubicola*	c	+	+	+	+	+		+
91	*Erithacus rubecula*	c	+	+	+	+		+	+
92	*Luscinia luscinia*			+					
93	*Luscinia megarhynchos*	c	+	+	+	+	+	+	+
94	*Phoenicurus ochruros*	c	+	+				+	+
95	*Oenanthe oenanthe*	p	+		+				
96	*Prunella modularis*			+					
97	*Passer domesticus*	c		+	+	+	+		+
98	*Passer montanus*	c	+	+	+	+	+		+
99	*Anthus campestris*	p	+	+		+	+	+	
100	*Anthus trivialis*	c	+	+	+	+	+	+	+
101	*Anthus pratensis*		+	+	+	+	+	+	+
102	*Anthus spinoletta*		+	+	+			+	

No.	Species	Nesting	OP1	OP2	0P3	OP4	OP5	OP6	OP7
103	*Motacillaflava*					+			
104	*Motacillafeldegg*	p		+	+	+		+	+
105	*Motacilla alba*	c	+	+	+				+
106	*Fringilla coelebs*	c	+	+	+	+	+	+	+
107	*Fringilla montifringilla*			+			+	+	+
108	*Coccothraustes coccothraustes*	c	+	+	+	+	+	+	+
109	*Pyrrhula pyrrhula*			+					
110	*Serinus serinus*	p	+	+	+	+		+	+
111	*Loxia curvirostra*					+			
112	*Carduelis chloris*	c	+	+	+	+	+	+	+
113	*Carduelis carduelis*	c	+	+	+	+	+	+	+
114	*Carduelis spinus*		+	+		+		+	+
115	*Carduelis cannabina*	p	+	+	+	+	+	+	+
116	*Emberiza calandra*	c	+	+	+	+	+		+
117	*Emberiza citrinella*	c	+	+	+	+	+	+	+
118	*Emberiza cia*						+		
119	*Emberiza hortulana*	c	+	+		+		+	+
120	*Emberiza schoeniclus*		+			+	+	+	
Total number of species		**58+19=77**	**88**	**87**	**72**	**79**	**58**	**60**	**77**
			119					**89**	
Total number of target species		**2+3=5**	**9**	**8**	**9**	**6**	**7**	**4**	**6**
			16					**8**	

Target species are particularly prominent (shaded and bold). Data on nesting are given in a separate column along the name of the species (c - certain nesting, p - potential nesting). At the bottom of Table 2.1. is the total number of all species and target species recorded by the observation points (OP - Figure 2.26) and total for the locations of the wind farm and for the control area. It can be seen that species are relatively evenly present in OP, with a minimum of 58 recorded on OP 5 and a maximum of 88 species recorded on OP 1. The number of target species recorded is relatively uniform. Observed collectively, and the number of all species and number of target species are smaller in the control area than in the subject area. In the subject area were registered 119 species, of which 16 were classified as targeted, while 89 species of birds were recorded in the control area, of which 8 were targeted. The only species recorded on the control, but not in the subject area, and belonging to the target category is *Halyaeetus albicila*.

Figure 2.26. *Layout of OP for monitoring birds in the area of the planned Kostolac wind farm (red color-control area)*

During 104 hours spent in the study of bird nesting in the subject area, two categories were recorded - certain and potential nesting birds.

Figure 2.27. *Nests positions in the research area in period April-July 2015*

In total, 58 species of birds were nested in the area, while 19 bird species were classified as potential nesting birds. Of the target species, only two of the most frequent species are certain nesting birds - mišar and vetruška, and three are marked as potential – jasteb, kobac and soko lastavičar. Such diversity of birds in the area envisaged for the Kostolac wind farm, was registered at individual observation points from which separate sites can be observed representing wind turbine groups, can be explained by the diversity and presence of particular types of habitat, their quality, as well as the location of the site, and their distance from Danube River. Based on the data from Table 2.2, of the total of 120 recorded species of birds 110 is on the Appendices of the Berne Convention (Official Gazette of RS, No. 102/2007), 82

of Annex II - strictly protected species, and 28 in Appendix III - protected species. In the framework of the Bonn Convention (Official Gazette of the RS, No. 102/2007), 44 of the species present are listed in Appendix II and 3 in the list of Appendix I. Under the EU Birds Directive [09/147/EC] in Appendix I is categorized 21 species, in Appendix II 22, and in Appendix III 4 species. In domestic legislation in the field of nature protection, out of 120 registered species, 94 were declared strictly protected, and 23 species were classified as protected (Official Gazette of RS, No. 36 / 2009a, 5/2010). A total of 15 species are classified into hunting game protected by closed season in a certain period of the year, while one is permanently protected (Official Gazette of RS, No. 18/10, 9/12). Only one of the species recorded has no protection status- domestic pigeons *Columba livia f. domestica*. They live in the surrounding settlements and occasionally live in smaller and larger flocks in the subject area for feeding on anthropogenic altered habitats under cultures, and only one locality has recorded their nesting.

Table 2.2. List of species of birds whose members are recorded on the area of potential wind power plant Kostolac and in the control area from December 2014 to November 2015 with protection categories

No.	Species	Berne	Bonn	Bird directive	Protection in Serbia	Close season
1	*Cygnus olor*	III	II	II	P	
2	*Anas platyrhynchos*	III	II	II, III	P	CS
3	*Coturnix coturnix*	III		II	P	CS
4	*Phasianus colchicus*	(III)		II, III	P	CS
5	*Perdix perdix*	III		II, III	P	CS
6	*Tachybaptus ruficollis*	II			SP	
7	*Phalacrocorax carbo*	III			P	CS
8	*Casmerodius albus*	II	II	I	SP	
9	*Ardea cinerea*	III			P	CS
10	*Ciconia nigra*	II	II	I	SP	
11	*Ciconia ciconia*	II	II	I	SP	
12	*Pernis apivorus*	II	II	I	SP	
13	*Circus cyaneus*	II	II	I	SP	
14	*Circus pygargus*	II	II	I	SP	
15	*Circus aeruginosus*	II	II	I	SP	
16	*Accipiter gentilis*	II	II		3	CS
17	*Accipiter nisus*	II	II		SP	
18	*Haliaeetus albicilla*	II	II	I	SP	
19	*Buteo buteo*	II	II		SP	
20	*Falco columbarius*	II	II	I	SP	
21	*Falco vespertinus*	II	II	I	SP	
22	*Falco subbuteo*	II	II		SP	

No.	Species	Berne	Bonn	Bird directive	Protection in Serbia	Close season
23	*Falco tinnunculus*	II	II		SP	
24	*Grus grus*	II	II	I	SP	
25	*Crex crex*	II	I	I	SP	
26	*Gallinula chloropus*	III		II	P	CS
27	*Larus ridibundus*	III		II	P	
28	*Larus canus*	III		II	P	
29	*Larus michahellis*	III				
30	*Columba livia f. domestica*					
31	*Columba palumbus*			II	P	CS
32	*Streptopelia decaocto*	III		II	P	CS
33	*Streptopelia turtur*	III		II	P	CS
34	*Cuculus canorus*	III			SP	
35	*Athene noctua*	II			SP	
36	*Otus scops*	II			SP	
37	*Asio otus*	II			SP	
38	*Strix aluco*	II			SP	
39	*Caprimulgus europaeus*	II		I	SP	
40	*Apus apus*	III			SP	
41	*Merops apiaster*	II	II		SP	
42	*Upupa epops*	II			SP	
43	*Jynx torquilla*	II			SP	
44	*Picus viridis*	II			SP	
45	*Dendrocopos major*	II			SP	
46	*Dendrocopos medius*	II		I	SP	
47	*Dryobates minor*	II			SP	
48	*Oriolus oriolus*	II			SP	
49	*Lanius minor*	II		I	SP	
50	*Lanius collurio*	II		I	SP	
51	*Lanius excubitor*	II			SP	
52	*Pica pica*			II	P	CS
53	*Garrulus glandarius*			II	P	CS
54	*Coloeus monedula*			II	P	
55	*Corvus frugilegus*			II	P	CS
56	*Corvus corone/cornix*				P	CS

No.	Species	Berne	Bonn	Bird directive	Protection in Serbia	Close season
57	*Corvus corax*	III			P	
58	*Parus caeruleus*	II		II	SP	
59	*Parus major*	II			SP	
60	*Parus palustris*	II			SP	
61	*Lullula arborea*	III		I	SP	
62	*Alauda arvensis*	III		II	SP	
63	*Riparia riparia*	II			SP	
64	*Hirundo rustica*	II			SP	
65	*Delichon urbicum*	II			SP	
66	*Aegithalos caudatus*	II			SP	
67	*Phylloscopus sibilatrix*	II	II		SP	
68	*Phylloscopus trochilus*	II	II		SP	
69	*Phylloscopus collybita*	II	II		SP	
70	*Acrocephalus arundinaceus*	II	II		SP	
71	*Hippolais icterina*	II	II		SP	
72	*Sylvia atricapilla*	II	II		SP	
73	*Sylvia borin*	II	II		SP	
74	*Sylvia nisoria*	II	II	I	SP	
75	*Sylvia curruca*	II	II		SP	
76	*Sylvia communis*	II	II		SP	
77	*Regulus regulus*	II	II		SP	
78	*Sitta europaea*	II			SP	
79	*Certhia brachydactyla*	II			SP	
80	*Troglodytes troglodytes*	II			SP	
81	*Sturnus vulgaris*			II	P	
82	*Turdus viscivorus*	III	II	II	SP	
83	*Turdus merula*	III	II	II	SP	
84	*Turdus pilaris*	III	II	II	SP	
85	*Turdus philomelos*	III	II	II	SP	
86	*Muscicapa striata*	II	II		SP	
87	*Ficedula hypoleuca*	II	II		SP	
88	*Ficedula albicollis*	II	II	I	SP	

No.	Species	Berne	Bonn	Bird directive	Protection in Serbia	Close season
89	*Saxicola rubetra*	II	II		SP	
90	*Saxicola rubicola*	III	II			
91	*Erithacus rubecula*	II	II		SP	
92	*Luscinia luscinia*	II	II		SP	
93	*Luscinia megarhynchos*	II	II		SP	
94	*Phoenicurus ochruros*	II	II		SP	
95	*Oenanthe oenanthe*	II	II		SP	
96	*Prunella modularis*	II			SP	
97	*Passer domesticus*				P	
98	*Passer montanus*	III			P	
99	*Anthus campestris*	II		I	SP	
100	*Anthus trivialis*	II			SP	
101	*Anthus pratensis*	II			SP	
102	*Anthus spinoletta*	II			SP	
103	*Motacilla flava*	II			SP	
104	*Motacilla feldegg*	II			SP	
105	*Motacilla alba*	II			SP	
106	*Fringilla coelebs*	III			SP	
107	*Fringilla montifringilla*	III			SP	
108	*Coccothraustes coccothraustes*	II			SP	
109	*Pyrrhula pyrrhula*	III			SP	
110	*Serinus serinus*	II			SP	
111	*Loxia curvirostra*	II			SP	
112	*Carduelis chloris*	II			SP	
113	*Carduelis carduelis*	II			SP	
114	*Carduelis spinus*	II			SP	
115	*Carduelis cannabina*	II			SP	
116	*Emberiza calandra*	III			SP	
117	*Emberiza citrinella*	II			SP	
118	*Emberiza cia*	II			SP	
119	*Emberiza hortulana*	III		I	SP	

No.	Species	Berne	Bonn	Bird directive	Protection in Serbia	Close season
120	*Emberiza schoeniclus*	II			SP	
Total number of species		111	45	43	117	15
Total number of target species		17	17	12	17	1

Although the total number of 119 species of birds in the subject area can be characterized as significant from a faunistic aspect, in quantitative terms the number of recorded individuals is relatively scarce.

Of the ecological groups of birds that are sensitive to wind turbines, and therefore was given special attention and which are especially classified in the so-called target species, only *Falconiformes* can be highlighted. It is surprising that in the subject area there were no significant *Anseriformes,* primarily geese (*Anser sp.).* In addition to the small number of wild ducks (*Anas platyrhynchos*) and a flyover of two *Cygnus olor* in autumn and winter months the usual *Anseriformes* flocks were not been recorded. Cloves and roe (*Ciconiiformes)* were recorded only sporadically either individually or several birds together. Although the subject area is not far from 3 rivers, and above all the Danube River, the lack of larger optimal water and humid habitats at the site does not favor the presence and retention of these two ecological groups of birds, which makes their nutrition, concealment and nesting difficult. Because of this, members of a small number of species of *Anseriformes* and *Ciconiiformes* are met in very small numbers and with very low frequency of recording.

Daily predators are constantly present at the site. This can be explained by the fact that there is a significant trophic base for the birds of this ecological group, which are primarily *Rodentia*, which are a significant element of fauna in agricultural habitats. For this reason, the most common are *Buteo buteo* and *Falco tinunnculus*, then seasonal and other predators such as *Circus sp.* and *Falcon sp.* A wider range of prey have *Accipiter gentilis* and *Accipiter nisus*, but members of these two species are recorded in an extremely low number. The finding of the *Haliaeetus albicilla*, which was observed only once in the control area, is also the only finding of eagles during more than 12 months of research. None of the flyover of the other target species can be characterized as significant. Night predators - owls (*Strigiformes*) were scarce in the subject area and presented with 4 species. Although their status of vulnerability is relatively high, they are not classified into target species due to their specific way of life and oriented hunting of rodents living on or in the surface, so the risk of kill during the operation of wind turbine infrastructure is low. Sing birds are represented by a large number of species, but mostly by a small number of representatives to which the potential wind farm would have no significant impact. Nevertheless, numerous examples of *Alauda arvensis*, *Sturnus vulgaris*, several species of herds and three types of swallow can be distinguished as important findings. Each of these species can be exposed in particular to the influence of the wind farm, but their classification into the lower categories of vulnerability, a positive population trend and a significant number do not give rise to concern. Other singers because of their ecological status and habitat use are even less likely to be endangered and at risk from the project of construction and operation of the Kostolac wind farm.

2.3.2. Conclusions of the one year ornithofauna monitoring

During the twelve-month study from the beginning of December 2014 until the end of November 2015, the presence of 119 species of birds was detected at the site in question (120 in the entire research area, which, in addition to the subject, would include control), most of which were in low numbers. As mentioned earlier, the greatest reason for the low number of specimens of recorded species in the investigated area is the extreme uniformity and the presence of sub-optimal habitats. Almost completely lack of the trees, as well as the middle floor vegetation (shrubs). For the investigated area are characteristic species that live on the surface. Of the species that would have potential damage from the wind generators, 17 target species were selected, which were specifically monitored and recorded. The extent, the height and the directions of the fly over speak about the potentially low effect and the intensity of any damage. Certain effects of wind turbine functioning can be assumed for some species of daily bird of prey that were the most numerous target species and recorded at critical heights such as *Buteo Buto* and *Falco tinnunculus*. Other species, such as the *Circus aeruginosus*, the *Accipiter gentilis*, *Accipiter nisus*, *Ciconia ciconia*, and the *Falco subbuteo*, were significantly less numerous and were flying at different heights from the surface but mostly up to 50m, i.e. height that would be beyond the reach of the future blade of the wind turbine generator.

In the survey period, a total of 252 observations/field works were realized, with 426 hours (322 + 104) realized within 36 field days. The largest number of species was recorded at OP 1- n= 88. In the whole area of the subject sites spring migratory activity were somewhat pronounced, while, on the other hand, wandering, autumn and wintering have less recognizable values. Out of a total of 513 findings (overflights) of the target species at the site, the most were on the observation points OP 5- 115 and OP 2- 110, although the remaining three OP numbers of the target species have similar, or somewhat less, values which correspond to sugnificant uniformity and monolithical habitat. The most overflights in the critical zone was on OP 3- 42% of the total number of overflights to that OP, and OP 4- 37%. This situation, observed during the one-year monitoring, given the number and behavior of the target species, speaks of the low likelihood of conflict in the case of the construction and functioning of wind power structures in the area in question.

The most sensitive monitoring subjects are the *Falconiformes* belonging to endangered species, which is why they are mainly in strict protection regime. Out of 17 target species, 12 of them belong to daily predators. The nesting of almost all kinds of predators has not been established, except for the most numerous - *Buteo buteo* and *Falco tinnunculus*. The most significant number of overflights was recorded for the two species mentioned, while the number of overflights recorded by other species is significant or extremely small.

Generally speaking, the most frequent range of flight altitudes of most species is from 0 to 50 m. Out of a total of 513 recorded overflights of target species, only 178 were in the critical altitude zone (equidistant height ranges 2, 3 and 4) from 60 to 180 m above the surface, which is about 35% of the total number of recorded overflights of the target species. However, most of such overflights belonged to the most frequent and most numerous predators on the site - *Buteo buteo* and *Falco tinnunculus*, which due to their numbers and permanent presence, but also on the basis of the characteristics of their flights, can not be described as endangered. The subject area does not provide optimal conditions for nesting of target species, so during the monitoring 5 active nests of the *Falco tinnunculus* and *Buteo buteo* were found mainly at the site.

Small flocks of *Streptopelia turtur*, small monotypic and mixed flocks of crow (*Corvidae*), as well as smaller flocks of *Sturnus vulgaris* and other bird singers are predominantly recorded outside the critical altitude zone, and in spite of the significant presence of representatives of these species, no significant negative impact of the future wind turbine park are not expected.

On the other hand, the original arrangement of positions of wind turbines was relatively acceptable from the point of the influence on bird fauna, except for the wind turbines that were predicted at the westernmost part of the investigated area, around the established OP 2.

Based on the foreseen layout of wind turbines on the future Kostolac wind farm and on the basis of data at the observation points, it can also be assumed that the significant negative impact of the construction and operation of the wind farm on the bird fauna should not be. The wind turbines at the future wind farm Kostolac, which are according to the project 20, according to the plan provided by the investor at the beginning of this monitoring, were located on four sub-locations on the location of the area. Based on the analyzed data on the presence and directions of the overflights of members of different bird species, as well as on the basis of the layout of wind turbines, it can be assumed that the greatest influence of the construction and operation of the future wind farm Kostolac will be on the members of the largest and most frequently present species. However, due to the registered characteristics of their overflights, and most often other target species that were flying at critical altitudes were very few, with considerable certainty it can be estimated that the influence of wind turbines on them will be minor. On the other hand, the original arrangement of positions of wind turbines was relatively acceptable from the point of view of the influence of bird fauna, except for the wind turbines that were predicted at the west part of the investigated area, around the established OP 2.

In synergy with preliminary findings and recommendations for the monitoring of bats, wind generators at the Petka location (OP 2) are therefore relocated. After the suggestions to the investor, the initial arrangement of the turbine, which is a compromise and satisfactory solution, was determined in the initial stages of the operation. The new situation in the area of the potential wind farm, besides meeting the requirements of preservation and protection of bird fauna, meets the criteria for protection and conservation of the fauna of the bats. Unlike bats, birds in the subject area do not have pronounced and strict flight corridors, but with minor investor movements of the wind generators it was been noticed that their new positions have a smaller effect on the area where there is a greater presence of target species, which can only increase the chances of safe passage of migratory and diurnal flight of the birds (and bats). The collected data and the performed analysis enable the assessment of the influence of the construction and operation of the wind farm on the birds. Guided by the recommendations based on previous international experiences, the targeted and other selected types were analyzed according to the possible impact, ie the effect of wind farms on them. Generally, the impacts are grouped into 4 large groups - disturb during the construction and operation of the wind farm, the barrier effect, direct collision with the wind turbines blades and the loss of habitats by the construction of a wind farm. Each of the impacts can be estimated if there is an insight into bionomy, autecology, number and behavior of birds.

Table 2.3. Impact assessment (XXX - large negative impact, XX - moderate, X - small, 0 - no impact) of the construction and operation of wind farm on birds target species

Species	Impact				
	Disturb	Barrier effect	Direct collision	Loss of habitats	Number
Cygnus olor	0	X	X	0	extremely small
Casmerodius albus	X	X	0	0	extremely small
Ciconia nigra	0	X	X	0	extremely small
Ciconia ciconia	X	X	XX	0	extremely small
Pernis apivorus	0	X	0	0	small
Circus cyaneus	0	0	X	0	small
Circus pygargus	0	X	X	0	small
Circus aeruginosus	0	0	0	0	small
Accipiter gentilis	0	0	X	0	small
Accipiter nisus	0	0	X	0	small
Haliaeetus albicilla	X	0	0	0	extremely small
Buteo buteo	0	0	XX	0	high
Falco columbarius	0	0	0	0	extremely small
Falco vespertinus	0	0	0	0	extremely small
Falco subbuteo	X	0	X	0	small
Falco tinnunculus	X	0	X	0	high
Grus grus	0	X	X	0	small

Table 2.4. Impact assessment (XXX - large negative impact, XX - moderate, X - small, 0 - no effect) on other selected birds species

Species	Impact				
	Disturb	Barrier effect	Direct collision	Loss of habitats	Number
Coturnix coturnix	0	0	0	0	medium
Columba palumbus	0	0	0	0	small
Streptopelia decaocto	0	0	0	0	small
Streptopelia turtur	0	0	0	0	small
Merops apiaster	X	X	XX	0	medium

Alauda arvensis	0	0	X	X	high
Hirundinidae	0	X	X	0	high
Corvidae	0	0	0	0	high
Turdus pilaris	0	0	X	0	small
Sturnus vulgaris	0	X	X	0	medium
Fringillidae	0	0	0	0	medium
Emberizidae	0	0	0	0	medium

As can be seen from Table 2.3. and 2.4, no strong negative intensity was assessed at the site for any influence. Of the target species, cumulatively the greatest effect would be on the storks and herons, buzzards, kestrels, and the swans, and among the other selected species of Bee-eaters, Eurasian skylarks and starlings. Although it is clear from the table what are intensities of impact on each species, it is important to say that the number of members of most of the mentioned species is relatively small and that therefore there should be no significant effect on them. It should be noted in particular that during the project period, i.e. in its winter aspect, extreme winter conditions were lacking, and therefore the water surface of the surrounding rivers Danube, Mlava and Mogila were not frozen. This conditioned that the migratory and wintering flocks of sailors and other birds of aquatic habitats did not undertake displacement in the area, which is why the expected overflights of flocks of these birds was probably missing. However, if extreme winter conditions occur in the future, flyovers pf these birds can be expected, so this observation should take into account when planning and constructing and recommending measures to prevent and reduce possible damage. On the other hand, it is necessary to emphasize the possible positive influence of the construction and operation of the wind farm and the accompanying infrastructure on certain types of birds. Thus, the construction of a transmission lines in terms of compulsory complementary infrastructure can have a significant effect on the nesting populations of those bird species that they favor for nesting. As it has already been established, many species are reluctant to nest on the transmission lines, such as *Passer spp*., *Sturnus vulgaris*, *Corvus corax*, *Corvus cornix*, *Pica pica*. The raven`s nests are commonly use predators such as *Falco tinnunculus*, *Buteo Buteo*, *Falco subbuteo*, *Falco cherrugs*, and very rarely *Aquila heliac*. Maintaining the space around the base of the pillars of wind turbines in the form of grass mowing can contribute to the increase in the number of nesting breeds of species affected by high grass, such as *Anthus* spp., *Motacilla* sp. and *Alaudidae*.

2.3.3. Results of one-year monitoring of hiropterofauna

The monitoring of the bats fauna for the needs of the project of construction of the Kostolac wind farm, which was implemented from November 2014 to November 2015 in the area of the wind farm, the immediate surroundings and the control area, by the ultrasound audiotechnology the activity of 14 species has been registered whose members can be reliably differentiated by the echolocation signals: *Rhinolophus ferrumequinum*, *Miniopterus schreibersii*, *Myotis bechsteinii*, *Myotis emarginatus*, *Myotis nattereri*, *Barbastella barbastellus*, *Pipistrellus pygmaeus*, *Pipistrellus pipistrellus*, *Pipistrellus kuhlii*, *Pipistrellus nathusii*, *Hypsugo savii, Nyctalus leisleri*, *Nyctalus noctula*, *Vespertilio murinus* and *Eptesicus serotinus*. In addition to these, the activity of representatives of the 4 groups of species whose members can not be reliably distinguished on the basis of echolocation signals is also registered - *Myotis myotis/oxygnathus*, *Myotis brandtii/mystacinus/alcathoe, Myotis*

daubentonii/capaccinii and *Plecotus sp*. - so it is certain that at least one species from each of these groups is present at the site, which makes at least a total of 19. However, it is very likely that this number is actually higher, i.e. 23, because at least occasionally and/or sporadic the presence of 8 species from these groups (*Myotis brandtii*, *M. mystacinus*, *M. alcathoe*, *M. myotis*, *M. oxygnathus*, *M. daubentonii Plecotus austriacus* и *P. auritus*) is almost certain based on their wider distribution and the existence of appropriate ecological conditions at the site and in the immediate vicinity. In support of this, data on the presence of at least some of these species in the vicinity of the site are presented (Table 2.5).

Table 2.5. List of types of bat recorded at the locations of the Kostolac wind farm, in the immediate vicinity and in the control area

Area / Species / group	Region	Control (0)		Surroundings (1)		Locations								TOTAL	
						Ćirikovac		Petka		Klenovnik		Drmno			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Rhinolophus ferrumequinum	+	12	0.9			4	0.6	1	0.3	2	0.3	15	3.4	**34**	**0.9**
Rhinolophus hipposideros	+														
Rhinolophus euryale	+														
Miniopterus schreibersii	+	3	0.2	**8**	**2.8**	2	0.3	11	2.8	9	1.5	4	0.9	**37**	**1.0**
M.brandtii/mystacinus/alcathoe Myotis oxygnathus Myotismyotis M.myotis/oxygnathus	+ +	362	2.8 0.2	**3**	**1.1**	332	4.5 0.3	101	2.6 0.3	9	1.5	3	0.7	**945**	**2.5 0.1**
Myotis bechsteinii		8	0.6			3	0.4							**11**	**0.3**
Myotis emarginatus	+	1	0.1			3	0.4							**4**	**0.1**
Myotis nattereri								1	0.3					**1**	**0.0**
M.daubentonii/capaccinii		1	0.1					1	0.3	1	0.2	0	0.0	**3**	**0.1**
Myotis sp.		24	1.9			16	2.2	7	1.8	2	0.3	0	0.0	**49**	**1.3**
Plecotus sp.		1	0.1			1	0.1			1	0.2	0	0.0	**3**	**0.1**
Barbastella barbastellus						1	0.1	1	0.3			1	0.2	**3**	**0.1**
Pipistrellus pygmaeus		+*								+*		1	0.2	**1**	**0.0**
Pipistrellus pipistrellus	+	6	0.5			2	0.3			2	0.3	2	0.5	**12**	**0.3**
P.kuhlii/pipistrellus		2	0.2			1	0.1			1	0.2	0	0.0	**4**	**0.1**
Pipistrellus kuhlii		482	37.3	**142**	**49.8**	442	60.9	205	52.6	222	37.4	132	30.3	**1625**	**43.6**
P.kuhlii/nathusii		273	21.1	**64**	**22.5**	125	17.2	99	25.4	158	26.6	154	35.3	**873**	**23.4**
Pipistrellus nathusii		111	8.6	**28**	**9.8**	32	4.4	19	4.9	42	7.1	45	10.3	**277**	**7.4**
P.nathusii/H.savii		11	0.9	**3**	**1.1**	9	1.2	3	0.8	3	0.5	7	1.6	**36**	**1.0**
Hypsugo savii		4	0.3			2	0.3	1	0.3	2	0.3	13	3.0	**22**	**0.6**
Pipistrellus/Hypsugo sp.		30	2.3	**15**	**5.3**	21	2.9	8	2.1	16	2.7	11	2.5	**101**	**2.7**
Nyctalus leisleri		17	1.3	**6**	**2.1**	2	0.3	7	1.8	23	3.9	16	3.7	**71**	**1.9**
N.noctula/leisleri		14	1.1	**1**	**0.4**			1	0.3	14	2.4	0	0.0	**30**	**0.8**
Nyctalus noctula		220	17.0	**9**	**3.2**	4	0.6	5	1.3	69	11.6	17	3.9	**324**	**8.7**
N.noctula/lasiopterus												1	0.2	**1**	**0.0**
Vespertilio murinus								1	0.3					**1**	**0.0**
Eptesicus serotinus		4	0.3	**3**	**1.1**	4	0.6	1	0.3	6	1.0	4	0.9	**22**	**0.6**
E.serotinus/V.murinus/Nyctalus		4	0.3	**1**	**0.4**	1	0.1	2	0.5	6	1.0	5	1.1	**19**	**0.5**
Chiroptera *indet.*		27	2.1	**2**	**0.7**	16	2.2	5	1.3	6	1.0	5	1.1	**61**	**1.6**

Area / Species / group	Region	Control (0)		Surroundings (1)		Locations								TOTAL	
						Ćirikovac		Petka		Klenovnik		Drmno			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	8	1293	100.0	285	100.0	726	100.0	390	100.0	594	100.0	436	100.0	3724	100.0
Activity Index		23.0		26.6		19.4		16.7		9.6		7.1		14.8	
Minimum number of species		16		7		15		14		13		12		19	

The presence of representatives of the species *Rhinolophus hypposideros* can also be expected in the field of this study, but only in a small number (similar to the similar and ecologically somewhat similar type of *Rhinolophus ferrumequinum*), because for it there are at least somewhat suitable habitats and shelters; it is possible that eventual present representatives of this type are not registered during this monitoring due to the expected minority and very quiet ultrasound signals, which are therefore difficult to register with ultrasound audio-detection. At the locations of the wind farm, the presence of the species *Myotis dasycneme* can be expected, at least occasionally and in a small number, because for them in the immediate vicinity of the site there are optimal habitats and shelters, and since this species was previously recorded in the nearby parts of the neighboring regions of South Banat and the Carpathian Serbia; moreover, it is very likely that there were a small number of (6-8) flyovers registered on transects during this monitoring, which could not be reliably identified to the level of the species due to not very typical characteristics of echolocation signals (which is why they are marked as *Myotis sp.*). The presence of representatives of the species *Rhinolophus euryale* can not be expected, since there are no suitable underground shelters in the area of research (not in the immediate vicinity), and representatives of this type total daily activity spend in the vicinity of the shelter. For the same reason, the presence of representatives of ecologically similar species of *Rhinolophus blasii, Rhinolophus mehelyi* and *Myotis capaccinii* can not be expected in the field of research, although they are recorded in the nearby parts of the neighboring region of the Carpathian Serbia. Although it has recently been registered in Serbia, the presence of representatives of the distinctively alpine species *Plecotus macrobullaris* can not be expected in the field of research due to the specificity of its ecology and distribution. As a curiosity, it should be noted that this monitoring registered species *Myotis bechsteinii*, *Myotis nattereri*, *Barbastella barbastellus*, *Pipistrellus pygmaeus*, *Pipistrellus kuhlii*, *Pipistrellus nathusii*, *Hypsugo savii, Nyctalus leisleri*, *Nyctalus noctula*, *Vespertilio murinus* and *Eptesicus serotinus*, and a group of types *Myotis brandtii/mystacinus/ alcathoe, Myotis daubentonii/capaccinii* and *Plecotus sp.* whose representatives were not previously recorded in the wider environment, i.e. in the region of Stig and Branicevo. With this number of species of bat fauna species of this region has been increased to at least 22, thereby confirming the initial monitoring hypothesis that a small number of previously recorded species was due to lack of research, and not measurements of the real state of the fauna.

All types of bats recorded by this monitoring are protected in Serbia by the Nature Protection Act (Official Gazette og RS, 36/2009a, 5/2010) and ratified international conventions (Official Gazette of the RS, No. 102/2007a, 102/2007b), as well as EUROBATS agreement with ratification in progress (EUROBATS 2015a), and in the European Union by the so-called European Directive on Habitats and Species [92/43/EEC]. In addition, 9 species registered by this monitoring, or considered potentially present in the field of research (*Rhinolophus ferrumequinum, Rh. hipposideros*, *Miniopterus schreibersii*, *Barbastella*

barbastellus, *Myotis emarginatus*, *M. bechsteinii, M. dasycneme*, *M. myotis* and *M. oxygnathus*) are also found in Annex II of the European Habitats Directive, i.e. for them in the EU strict measures of special additional protection and monitoring of populations apply. Despite a significant number of species, it should be noted that most of them during the manual detection were recorded in a very small relative number, i.e. only several times compared to 3724 flights/contacts total recorded on transects.

Most, even 3099, that is, than 83% of all registered flyovers/contacts is on only 3 types: *Pipistrellus kuhlii*, *Pipistrellus nathusii* and *Nyctalus noctula*, with their real relative numbers even greater, as representatives of these species certainly have a significant share of an additional 252, 6.8%, the amount of flying/contacts that could not be identified more precisely than the level of gender, group of species or family (due to long distance and short duration). Additionally, among these species, a relative number of 43.6% (with the largest part of additional 27.9% of incompletely identified overflights) clearly distinguishes *Pipistrellus kuhlii*, so this species can be considered to be highly dominant in the entire field of research, while the species *Nyctalus noctula* with 8.7% and *Pipistrellus nathusii* with 7.4% subdominate. All other species were far less represented: 2.5% of the flyovers belonged to the representatives of the *Myotis brandtii/mystacinus/alcathoe* group and 1.9% to the representatives of the *Nyctalus leisleri* species, while all other species/groups, 14 of them, were recorded with an almost negligible relative number - below 1% (8 of them only sporadically - 5 or less during the entire duration of the monitoring). Very similar relative number of species are also observed on transects observed individually, i.e. at all locations of the wind farm, both in the vicinity and in the control area. And the situation on the planned positions of wind generators, i.e. the corresponding points of censuses are completely complementary, as here also there are clear domination of the group *Pipistrellus/Hypsugo/Miniopterus* spp. (in which belongs dominant species on the transects of *Pipistrellus kuhlii*), and the subdomination of the group *Nyctalus/Vespertilio spp.* (where the subdominant species of *Nyctalus noctula* belongs), although this is not so pronounced here. Significant deviations are noted only at the census points within the control area where the dominance of the *Nyctalus/Vespertilio spp.* and the subdomination of *Pipistrellus/Hypsugo/Miniopterus* spp.

Because of this distinct dominance of one but almost negligible number of the vast majority of other species, in spite of the significant total number of registered species, it can be estimated that the fauna of the bats of the research area, as well as the individual locations of the wind farm, but also the surroundings and the control area, in a qualitative sense scarce and that according to these characteristics of the quantitative composition resembles the edges of highly urbanized zones or to typical agroecosystems under monocultures.

This is confirmed by the fact that these characteristics (the most prominent domination of one species, the smallest number of registered species) are most pronounced on the transect around the site, but also on the transects on Ćirikovac and, in the zone of the research area characterized by the highest degree of urbanization, and that the dominant species of *Pipistrellus kuhlii* is also the most prominent synanthropized species of bats in this part of Europe.

2.3.4. Conclusions of a one-year monitoring of hyropterofauna

Based on the data collected from this monitoring and previous knowledge from the immediate and wider environment, in the previous part, an analysis of the ecological functions of the site of the

wind farm's location and the immediate environment for bats was carried out, indicating that bats use this space and the present habitats and what is their significance for the presence of bats, as summarized in Table 2.6.

Table 2.6. Estimation of the importance of ecological functions, intensity of activities and relative numbers of members of different types of bats

Species	Shelters	Flight corridors	Hunting territories	Migration inflow	Migration corridors	Activity intensity	Relative abundance/ number
Pipistrellus kuhlii	not present	seasonally moderate	seasonally moderate	*not migrating*		seasonally and locally very high	very high
Pipistrellus nathusii	negligible	low	low	negligible	probably negligible	occasionally moderate	moderate
Nyctalus noctula	negligible	low to negligible	locally moderate	negligible	probably negligible	occasionally and locally high	low to moderate
Hypsugo savii	not present	potentially moderate	potentially moderate	*not migrating*		potentially high	potentially high to moderate
Other species	not present	negligible	negligible	negligible	negligible	negligible	negligible

Knowing the situation at the location (Table 2.6) and the characteristics of the planned project is necessary to identify possible conflicts that may occur during the different phases of project realization. However, to what extent can the identified conflicts during the project's realization reflect on the situation on the field, that is, how much and how much project impacts can be expected on the bats in the location does not depend solely on the ecological and faunistic situation on it.

The risk to which particular species can be exposed depends largely on their ecological and bionomical characteristics, so their knowledge is necessary for a full impact analysis and, in particular, for an appropriate risk assessment (importance of the impact).

An overview of the ecological and bionomical characteristics of the species (potentially) present at the site that may be relevant for this analysis is given in Table 2.7.

Table 2.7. Relevant ecological and bionomical characteristics of the types of bats present and potentially present at the location of the wind farm and in the immediate vicinity and possible influences

Species	Flight at low altitudes	Flight at high altitutes (> 40 m)	Hunting near habitats structures (vegetation, buildings, etc.)	hunting around lighting	Shelters in the wind generators gondola	Migration to long or medium distance	Risk of direct kill	The share of the identified victims of the direct kills in Europe
Rhinolophus	X		X				low	0.02%
Rhinolophus euryale	X		X				low	
Rhinolophus hipposideros	X		X				low	
Miniopterus schreibersii	X		?	X		X	high	0.20%
Myotis mystacinus	X		X				low	0.07%
Myotis brandtii	X	X	X				low	0.02%
Myotis alcathoe	X		X				low	
Myotis oxygnathus	X	X	X			X	low	0.09%
Myotis myotis	X	X	X			X	low	0.13%
Myotis bechsteinii	X		X				low	0.02%
Myotis emarginatus	X	X	X			?	low	0.04%
Myotis nattereri	X		X				low	
Myotis daubentonii	X	X	X			X	low	0.20%
Myotis dasycneme	X	X				X	low	0.07%
Plecotus auritus	X	X	X				low	0.13%
Plecotus austriacus	X	X	X				low	0.16%
Barbastella barbastellus	X		X				moderate	0.11%
Pipistrellus kuhlii	X	X	X	X	X		high	5.38%
Pipistrellus nathusii	X	X	X	X	X	X	high	20.19%
Pipistrellus pipistrellus	X	X	X	X	X		high	27.01%
Pipistrellus pygmaeus	X	X	X	X	X	X	high	4.89%
Hypsugo savii	X	X	X	X	X		high	5.03%
Nyctalus leisleri		X	X	X	?	X	high	10.72%
Nyctalus noctula		X		X	?	X	high	20.84%
Vespertilio murinus		X		X		X	high	2.98%
Eptesicus serotinus	X	X	X	X	X		moderate	1.66%

When the on-site situation is known (Table 2.6) and when the ecological and bionomical characteristics of the present species are known (Table 2.7), and when, on the other hand, the possible and potential impacts of the wind turbine projects on bats are known, it is possible to perform a reliable assessment of the impact of a specific wind turbine project on bats and to assess the risk and possible significance of each of these impacts (Table 2.8). The influence of ultrasound emitted by wind generators as well as the loss of hunting territories due to the avoidance of wind farms has not been considered here, because today it is known that these effects are not significant.

Table 2.8. Potential impacts on local and migratory populations of bats (potentially) present at the site and assessment of their significance

Species	During construction		During the work of the project		Population
	Loss of the shelters due to construction	Loss of hunting territories due to construction	Loss / disruption of flying corridors	Direct death (collision, barotrauma)	
Pipistrellus kuhlii	none	low (1)	low (1)	moderate (6)	Local
Pipistrellus nathusii	negligible (2)	negligible (3)	low (4)	moderate (7)	
Nyctalus noctula	negligible (2)	negligible (5)	negligible (5)	moderate to high (7)	
Hypsugo savii (8)	none	none	none	potentially moderate to high	
Other species (9)	negligible or none	negligible	negligible	negligible	
Pipistrellus nathusii (9)	negligible	negligible	negligible	negligible	Migratory
Nyctalus noctula (9)	negligible	negligible	negligible	negligible	

Even total removal of woody and bushy vegetation during the project implementation phase and maintenance of such condition during the operation of the project, as well as the positioning and operation of wind turbines or other infrastructure on important flying corridors, which for the members of the species *Pipistrellus kuhlii* the most important hunting territories in the locations, due to the specificity of bionomy and ecology of this species can only lead to a partial loss of these functions in these zones, which would have little significance for the local population of this species, in accordance with the significance of these functions and the fact that a substantial part of their flying corridors and hunting areas are not in the locations of the wind farm but in the surroundings, but can not be covered by this influence.

Even the complete removal of trees in which there is a negligible number of registered and potential shelters of individual members of these species, in accordance with their number and significance, would have a negligible significance.

Only total removal of woody and shrub vegetation on complete site locations during the project implementation phase and the maintenance of such condition during the operation of the project, which is not provided for by the General Project, could have an impact on the slightly less significant hunting area of this species on site.

Total removal of woody and shrubby vegetation during the project implementation phase and the maintenance of such condition during the operation of the project, as well as the positioning and operation of wind turbines or other infrastructure in zones on important flying

corridors would have little significance for the local population of this species, in accordance with the significance these flying corridors.

Due to the specificity of bionomy and ecology of this species, the works on the execution of the project, as well as the operation of the wind farm, can not significantly impair the daily transitional or hunting activity of members of this species, which usually occur at altitudes above 40 m within corridors that are not strictly spatially defined, which is confirmed by the observations during this monitoring.

Members of this species are registered in Europe as victims of wind turbines, with a significant share in the identified victims but smaller than other species of this genus; to what extent this share is smaller because most of these data refer to parts of Europe in which this species is not present or are few and with possibly lesser risk due to the specificity of ecology and bionomy, it is not possible to be reliably estimated at this moment, but it is believed that there is a high risk of their direct death. Since the members of this species at the locations during the period of this monitoring are convincingly relatively numerous and, at least sometimes during the summer and spring, have a high and very high intensity of activities, and the risk of kills is high, it can be expected that the rate of direct death at least in this period would be high. However, since members of the local population of this species most of their activities realize outside the locations, and they are extremely numerous and dominant, not only in settlements in the immediate and wider surroundings of the site, but also in all urban habitats in Serbia, even the very high rate of deaths caused by the work of the subject wind turbine would not have a significant impact on the population of this species.

Members of the species *Pipistrellus nathusii* and *Nyctalus noctula*, due to the specificity of their bionomy, are among the most common victims of wind turbines in Europe. Because, therefore, a high rate of their death can be expected, and members of local populations of both species are present at all locations and, at least during the spring and/or summer in some cases, relatively numerous with moderate and high intensity of activity, in accordance with the characteristic spatial and the time dynamics of the activities of each of them, occasional and/or sometimes the impact of death on these populations can be expected.

Members of the *Hypsugo savii* species were not registered during this monitoring in a significant number or with significant activity, nor their significant ecological functions at the locations of the wind farm or in the vicinity were noticed, so they can not be exposed to the effects of the constrution and operation of the wind farm project. However, this species is expanding the areal in Serbia and relatively rapidly increasing its number, especially in urban areas, so it can be expected that in the locations zones in following years, their number and flight corridors and hunting territories will increase in (not shelters, which are potentially only found in the zones of neighboring settlements), and thus activities. For this reason, special attention should be paid to this species during the implementation of post-structural monitoring.

Members of all other species, i.e. populations, were registered at locations only sporadically and in extremely small numbers. Locations do not have an important function for these local/migratory populations, and therefore the project of a wind farm can not have any significant effect on their ecological functions. Although there is a significant risk for all species recorded as victims of wind turbines, given the negligible activity intensity of these species/populations at locations, this risk can be characterized as negligible and thus the impact of kills on their local/migratory populations.

2.4. Overview of cultural heritage

There are no registered and protected cultural heritage and archaeological sites at potential locations for the construction of the wind farm at the Kostolac site. Considering the richness of the surroundings with archaeological sites and protected cultural assets, it is necessary to pay special attention to the realization of the project, that is, to the foundation of wind turbines in order to avoid possible damage to the elements of cultural heritage.

On the wider area of the planned wind farm Kostolac B, there is a site called Rukumija - an archaeological site from the Bronze Age and a monastery. Today's monastery is from the time of Prince Miloš Obrenović (1852) and is located near the village of Bradarac, about 1km southeast of the closest wind turbine.

2.5. Overview of settlements and infrastructure

Anthropogenic activities are very present in the vicinity of sites, and the sites themselves are mostly the product of anthropogenic activities. Directly along the border of the locations are numerous settlements – town Kostolac and the village of Stari (Old) Kostolac, Drmno, Bradarac, Maljurevac, Ćirikovac, Petka and Klenovnik, as well as the complexes of administrative and/or industrial facilities of Thermal power plants and surface mines Kostolac.

The most spread activities are agriculture and, specifically, mining and energy, which is why a very different infrastructure is developed. The location and surroundings are intersected with a dense network of high-voltage power lines (Figure 2.28). Between the locations of Petka and Ćirikovac, and next to Klenovnik, the state road of the IIA order Požarevac-Kostolac (159) passes, while the state road of the IIB order Ram-Kličevac-Bratinac (372) passes along the Drmno site.

Figure 2.28. *Several high-voltage power lines are located in the planned area*

Figure 2.29. *Roads that intercross the area - the location of Ćirikovac*

Only the unpaved roads exist at the locations themselves, with at least one well maintained road from the crushed stone (Figure 2.29) which passes through the entire location and exits to one of the mentioned asphalt roads, while the side roads are mostly dirt roads and poorly maintained. In some parts of the unpaved roads there are initial landfills, especially in the zone around the settlement. Construction sites on the locations are rare, and the closest are the complexes of the administrative and industrial facilities of the Thermal Power Plant and the surface mine Kostolac. The settlements are located in the immediate vicinity, but at a minimum distance of about 500m from the nearest wind turbines.

Figure 2.30*. Part of the complex of adminisration buildings of the surface mine Ćirikovac*

3. PROJECT DESCRIPTION

Technical-technological description of wind farm

The complex of the wind farm (Figure 3.1) consists of the following functional units: wind turbines representing generator units (consisting of rotor, gondola, pillar and foundation, 690V/35kV voltage level), internal cable networks (underground cable lines of voltage level 35kV), substation 35/110 kV with command and administrative building (through which the wind farm connects to the transmission system for the placement of generated electricity and from where the power plant operates) and access roads (physical access for the transport of equipment, construction and installation of the equipment of the wind turbine and substation; it can coincide with the internal cable network route partially or completely). In the context of the above, it can be concluded that the complex of a wind farms consist of infrastructural facilities for the production of energy (wind turbines), facilities for transmission of energy (internal cable network and SS with administrative and command building) and traffic facilities (access roads).

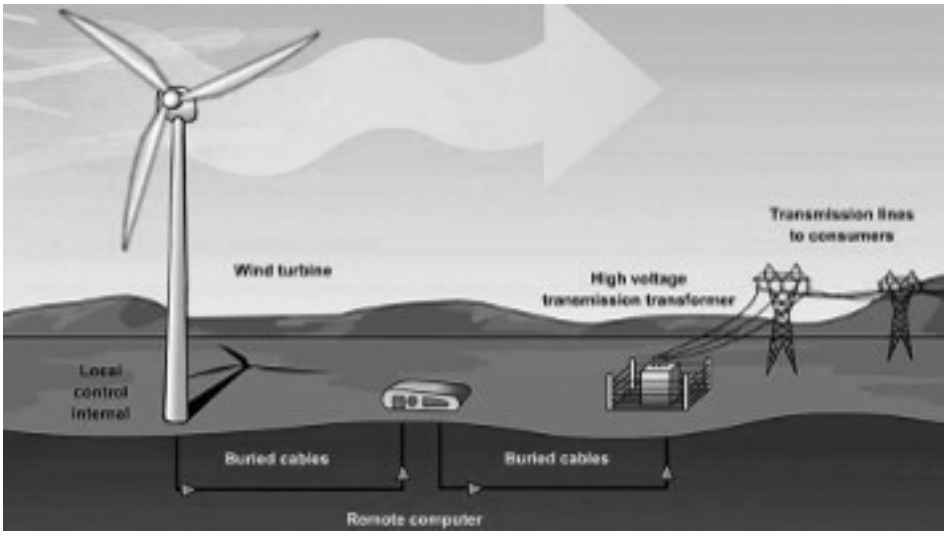


***Figure 3.1**. The principle of complex and functioning of the wind farm*

Spatial characteristics of the wind farm

The complex of the wind farm is located predominantly in the areas of external landfills in Kostolac, which were created as a result of mining activities. All functional units of the wind farm are located in the territory of the municipality of Požarevac, within the cadastral municipalities Bradarac (locality Drmno), Klenovnik (part of the locality Petka and part of the locality Klenovnik), Ćirikovac (part of the locality Petka and the entire locality of Ćirikovac) and Kostolac selo (part of the locality Klenovnik).

The layout of the wind turbines was determined by the wind resources (Figure 3.2) in order to maximize the use of primary energy and vary in the range of about 300 to 1000 meters. The wind farm is located in the zone of the Spatial Plan of the Special Purpose Area of the Kostolac coal basin (Official Gazette of RS, No. 1/2013) including additional updates of it (Official Gazzete of RS, No. 20/2018, which provides the use of renewable energy sources (Chapter 5.1.4 of the Plan) with a preliminary assessment of justification of the construction

of a wind farm, which is based on the measurement of wind parameters. The aforementioned was processed through the Preliminary feasibility study with the general project of the "Kostolac" wind park - a variant with the maximum utilization of the wind potential from May 2015 (processors Netinvest doo and Elektroistok-inženjering d.o.o., PR-EPS-VP2 / 14 - rev.3.2), where the previous study proved the justification for the construction of a wind farm and gave an overview of the necessary steps for the further realization of the investment.

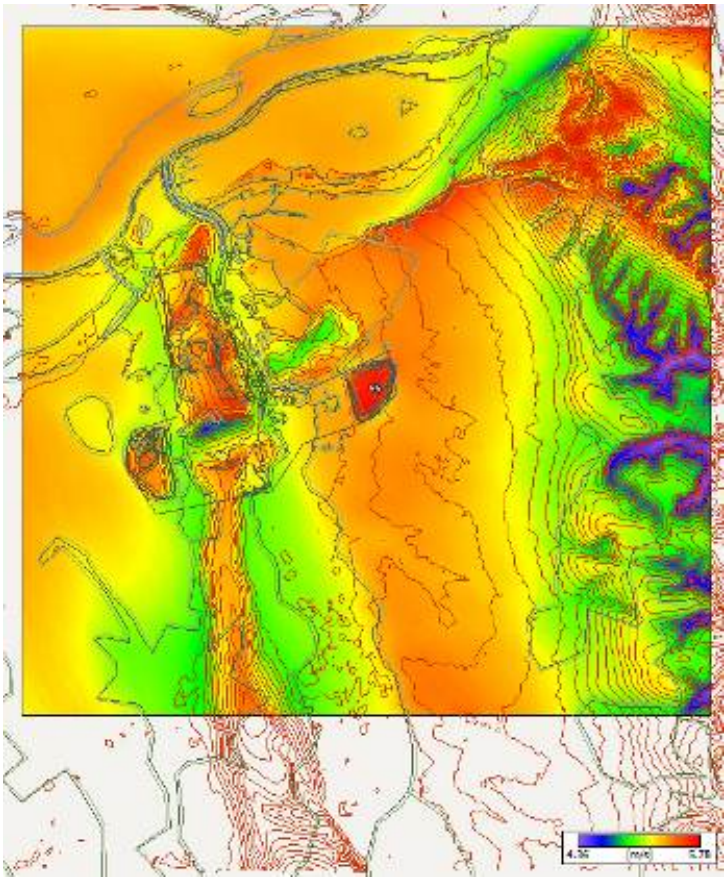


Figure 3.2. *Map of the wind resource in the Kostolac Basin*

Figure 3.3. *Disposition of wind turbines within the wind farm in Kostolac*

Table 3.1. Coordinates of wind turbines positions according to the locations on which they are located

No of WTG.	Coordinates for wind turbines		Cadaster plot No.	Cadaster municipality
	Y	X		
01	7,520,058.63	4,950,558.27	429	Bradarac
02	7,520,341.48	4,950,844.31	475	Bradarac
03	7,520,690.05	4,950,965.89	468	Bradarac
04	7,521,045.85	4,951,073.81	452/1	Bradarac
05	7,520,238.33	4,949,721.22	612, 613	Bradarac
06	7,520,579.29	4,949,985.23	547	Bradarac
07	7,520,923.42	4,950,293.97	522	Bradarac
08	7,514,114.83	4,948,955.24	2896	Klenovnik
09	7,513,893.13	4,948,359.10	1550	Cirikovac
10	7,514,336.57	4,948,295.17	1550	Cirikovac
11	7,517,042.52	4,948,913.09	1551/1	Cirikovac
12	7,516,721.82	4,948,448.70	1551/1	Cirikovac
13	7,516,390.04	4,948,159.02	1551/1	Cirikovac
14	7,515,767.36	4,948,122.53	1551/1	Cirikovac
15	7,516,280.40	4,950,439.97	2482/1, 2482/2	Klenovnik
16	7,516,061.38	4,951,403.63	1433, 1434	Klenovnik
17	7,515,811.00	4,952,203.00	2650/1	Kostolac selo
18	7,515,218.52	4,951,883.76	1417	Klenovnik
19	7,515,049.81	4,952,757.18	1640/1	Kostolac selo
20	7,515,040.65	4,953,925.17	1640/1	Kostolac selo

Technical description of the temporary delivery point

Temporary delivery point (TDP) is forceen on the existing asphalt plateau, which has been used for transhipment in building TPP Kostolac, and is located between the river Mlava and the coast fortification embankment.

In front of the TDP, a turnaround is foreseen in order to place the transport vehicles in the position so that the parts of the wind turbine could directly place to the transport vehicles from the barges with the appropriate mechanization of the transhipment. It is envisaged to raise the existing asphalt plateau to the level of the road, or about 3 m in relation to the existing asphalt plateau.

The dimensions of the plateau and the altitute of the gradient can endure the changes after specifying the dimensions of the barges and the way of transhipment, the required carrying capacity of the trrafic structure and the special conditions that can be prescribed by the equipment supplier. The longitudinal fall of the TDP follows the entire length of the road, on which individual wind turbines will be transported to the location. The TDP transversal drop is 1%.

The layers of trrafic structure envisaged on the plateau of the temporary delivery point:

- Asphalt concrete AB 11C = 4 cm
- BNS 22cA = 6 cm
- Crushed stone aggregate DK 0-31,5mm = 5 cm
- Crushed stone aggregate DK 0-63mm = 15 cm
- Sandy gravel material = 45cm

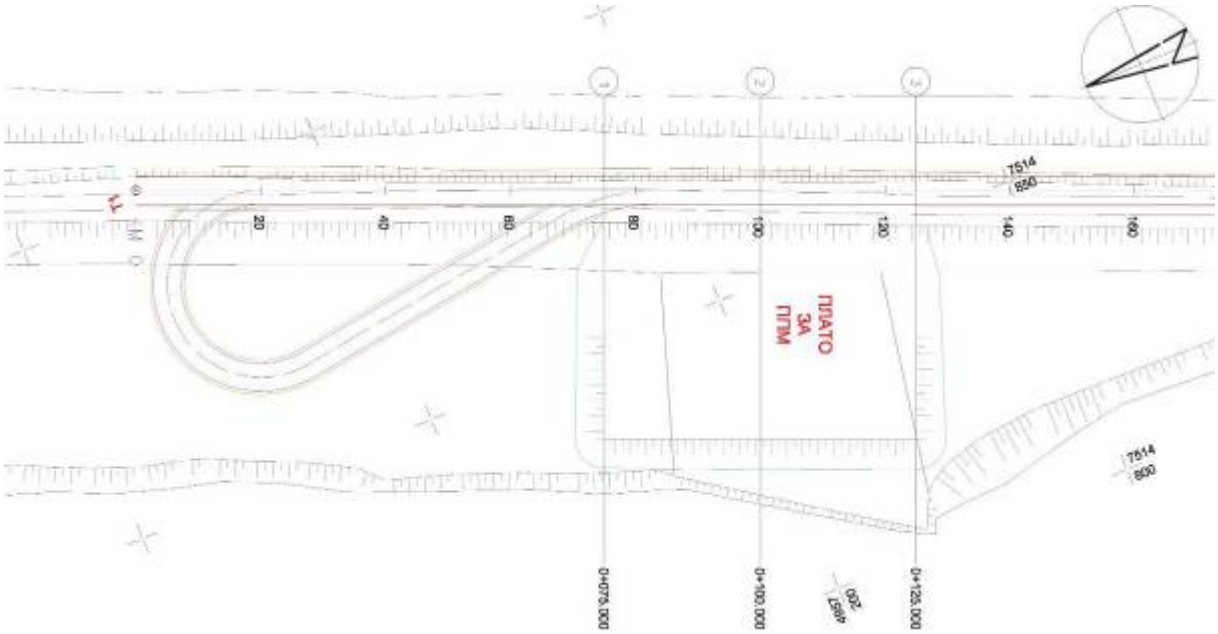


***Figure 3.4**. The situation of the temporary delivery point*

***Figure 3.5**. Position of the TDP in the macrolocation*

Transport, transshipment, further transport, installation and commissioning of wind turbine equipment is conditioned by the manufacturer's propositions in order to obtain a guarantee on the delivered equipment. In accordance with the above, the manufacturer/supplier also transports and supplies equipment to the sites of individual wind turbines. The TDP site is one of the points in the transport, but the transport technology is within the competence of the manufacturer/supplier of the equipment, in accordance with the indicative offer and the technology applied, depending on the case (which also affects the price). Because of this, the

definitive technical solution for the equipment transhipment is not available at the time of development of this Study, but further options for carrying out the transhipment are presented (shown in chapter 4 of this study) and it is certain that the individual or combination will be applied in the transport process, i.e. equipment transshipment.

TDP location is located at the confluence of the Topla Mlava in the Danube, about 200 meters upstream from the confluence, on the right bank. The width of the water surface of the Topla Mlava at the TDP site is about 50 meters and can vary depending on the water level. The depth of the draught of the Topla Mlava at the TDP is about 2 meters and can also vary depending on the water level. This is the input data to be taken into account when dimensioning barges/ships that will transport equipment; if the equipment is transported with large cargo with a draught deeper than the existing, then it will be necessary to anticipate a smaller ship or barge that will partially transport equipment from the confluence of the Topla Mlava in the Danube to the TDP, and then carry over by one of the methods described in the following chapters. If a smaller barge/boat with a crane is used, then the pushed composition that brings the equipment to the confluence does not have to have its own crane (can be delivered by barges/boats), and by auxiliary barge/boat will be transshipped from the pushed composition to the auxiliary barge/boat, then transport to TDP, as well as transfer from auxiliary ship/barge to TDP. If the carriage is done by boat with a crane, then an auxiliary barge can be used to ship a part of the equipment from the ship, and then use the auxiliary barge to the TDP containing the transshipment crane. Optionally, and if the depth of the draught allows, it is possible to consider the transport of complete equipment with one boat with a crane that will tranship the equipment directly to the TDP, but remains unknown and problematic the acceptance of such a cargo or a pushed composition by the capacity of the ToplaMlava at TDP (the length of such a ship would be over 200 meters, 30 meters wide and more, and the question of the depth of the draught for such cargo remains).

The variant solutions for the transhipment of the wind turbine equipment include the following or the combination of the following options:

The use of a temporary crane on the TDP for the loading of barges/ships, and the same crane will later be used for the instalation of the wind turbines;
Use of ships/barges with crane, or their combination, if it is not possible to access the TDP by a larger ship;
Use of ships/barges with crane with supports, in the event that the riverbed of the Topla Mlava, and if the water level causes the ship/barge to become trained, i.e. additional factors of uncertainty regarding stability and functionality;
Use of the pontoon bridge or platform as a pre-access part of TDP, which should be combined with one of the above mentioned variants.

Architectural and construction description

The main objects of the wind farm are the pillars and foundations of the wind turbines whose height can vary depending on the selected type of wind turbine. The wind farm consists of a total of 20 wind turbines whose height of the rotor axis is 117 meters and the total height with the blade in the vertical position is 180 meters (117 + 63 = 180). Wind turbine consists the foundation, steel pillar made of segments that are connected, gondola in which a generator unit is located, rotor that mechanically drives the generator unit and the blades that transform the kinetic energy of the wind into mechanical and conveys to the rotor. For the needs of the construction of a wind turbine, the access ramps on which the crane is mounted for mounting the equipment (placement of steel segments of the pillar, then the gondola, rotor and the

blades) are used which are located along the access roads. The positions of the pillars are predominantly located at sites that were formed by filling of the tailings from SM Ćirikovac and SM Drmno (the exception is the so-called Požarevačka greda, ie. the locality of Klenovnik).

Figure 3.6. *Disposition of a typical wind turbine*

The foundation of the wind turbine pillars must ensure the stability of the wind turbine during the entire exploitation period. The pillar of the wind turbine usually has a shape of a hollow, sealed coupe, and is made of high quality steel.

Figure 3.7. *Example of wind turbines foundation*

Figure 3.8. *Photographs with an example of assembly of the blade parts*

In addition to the pillars of the wind turbines, this project envisages the construction of the 110/35 kV substation and the administrative building of the wind farm located on the common plateau. An open storage space is also provided on the same plateau. The plateau is 135 mx75 m and is completely enclosed with an outer fence. The administrative building of the wind farm is separated from the substation by the inner fence, as well as the storage space. Along the plateau, a tank for supply of the fire and technical water is planned (Figures 3.9 and 3.10).

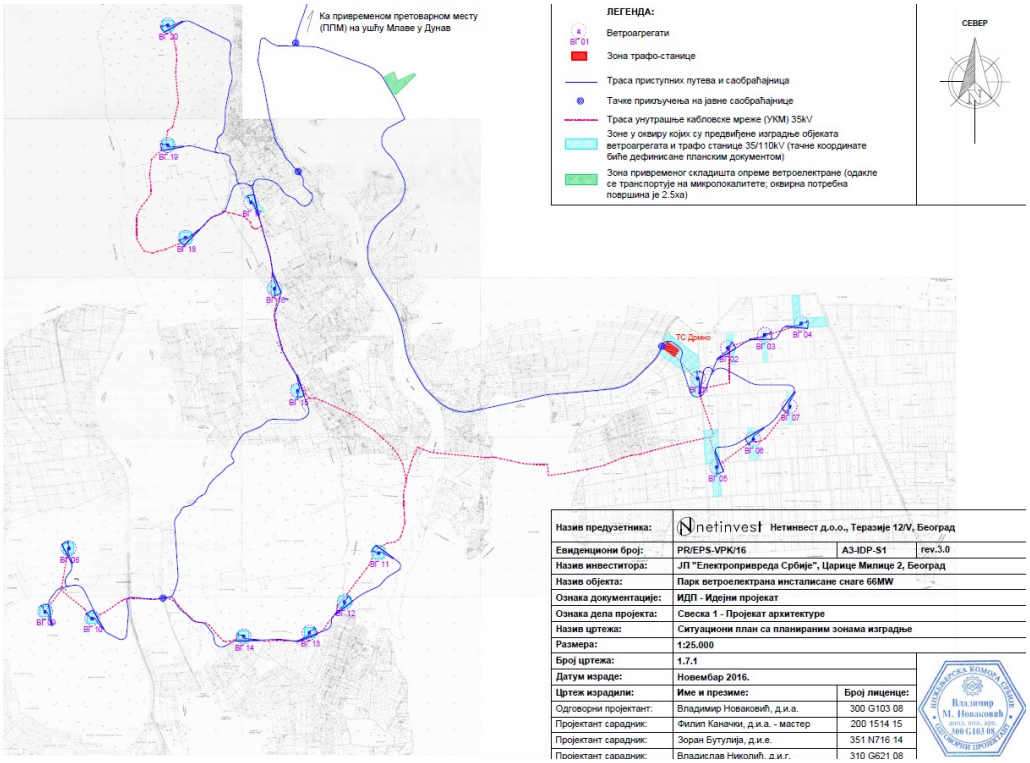


Figure 3.9. *Position of the 110/35 kV substation in the wind farm Kostolac*

The administration building of the distribution system is the ground level facility approximately 20x15. The building can be divided into two functional units- for equipment storing and people premises, who control the operation of the wind farm and servicing of equipment. Up to five people are foreseen to work in one shift. When choosing the floors, walls and ceilings treatment, resistance to fire must be taken into account. The facade walls, windows, doors and roof structure must meet the requirements of energy efficiency, and is recommended to use the autonomous systems to supply electricity and heat. The building is equipped with ventilation and air conditioning installations, lightning protection, lighting, grounding and heating.

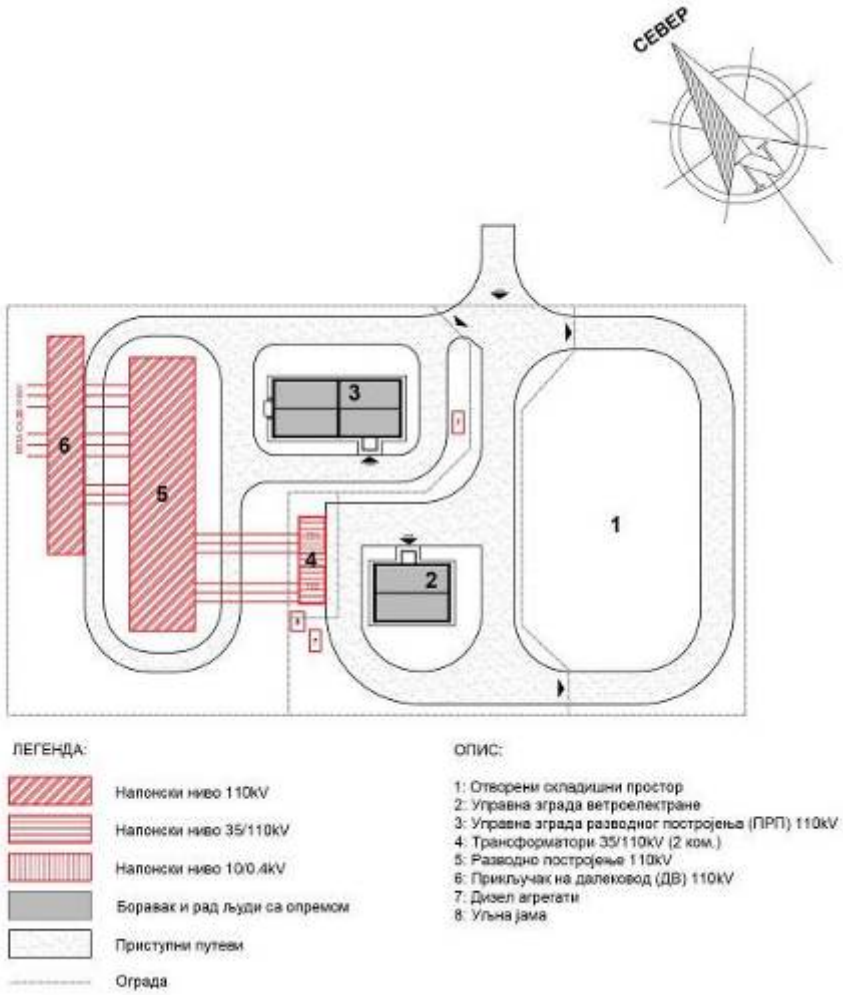


Figure 3.10*. Complex and organization of the 110/35 kVsubstation and the administrative building of the wind farm Kostolac*

In addition to the two above-mentioned buildings, in the 110kV outdoor distribution system, there are three relay housing is considered. The facilities are a system of supporting walls, with reinforced concrete ceiling, covered with sloping roof. The foundation of the building is on striped foundations.

Portals and carriers of the equipment are steel-lattice structures, based on the single foundations. The estimated depth of foundation of the portal is 2.5 m and for the carriers 1.5m.

Oil pit and transformer base are made from reinforced waterproof concrete and are connected by oil sewage when oil transformer solution is chosen (if so-called "dry" transformers are selected then this type of solution is not required due to environment protection is guaranteed from oil dripping). Between transformer bases fire wall is planned.

Grid connection utility has channels maid from reinforced concrete with covering slabs. Within the complex access roads and paths are designed.

Fire protection and technical water supply is provided with reservoir with pump station. Those two systems are independent each from another, with two chambers where one is for technical water supply while other is for fire protection water. Reservoir is to be supplied with water trucks. Reinforced waterproof concrete pit is designed for sewage, and it is to be serviced with sewage trucks.

For substation grid connection to existing 110 kV grid, additional columns may be provided between the substation and the grid line, according to the technical conditions issued by the grid operator. If such columns are required, their foundation should be done with separate reinforced concrete slabs 2.5m bellow the ground level.

Electro-energy description

The 110kV distribution system is designed for outdoor installation and is implemented with two bus systems, dispositively positioned to facilitate the introduction of a 110 kV transmission line. It consists of two transmission fields, two transformer fields, one coupling field and two measuring fields. All necessary switchgear and oxy-coupling equipment is installed in the fields. The distributio system should be dimensioned on the basis of short-circuit data that are valid for the electrical grid at the point where the wind farm is connected and according to the technical conditions of the transmission system operator. The distribution system is connected to the electrical grid over 110 kV transmission line in accordance with the requirements of the PE EMS.

Transformation 110/35 kV consists of two transformers 110/35 kV, 20(25) MVA and is dispositively located next to the command-power building and DS 110 kV. DS 35 kV is located in the administrative building of the wind farm, dispositively located to facilitate the introduction of connection cables according to the 110/35 kV transformation, according to condenser batteries and wind turbines. For the installation of secondary equipment in the field of 110 kV system, protective, command, signal and measuring equipment, as well as the 230V, 50Hz and 220V DC, relay cabinets are located along the transport path. In addition to the transport route, a cable channel will be provided for command-signal and power cables for interconnections of the relay cabins and relay cabins-command building connections. From the relay cabins to the equipment in the field cables are laid in the ground.

In the command-power building of the distribution system 110 kV, all standard equipment for this type of plant is envisaged: 10 kV facility, 10/0.4 kV transformers and 0.4 kV low voltage facility for own consumption of the plant, DC and safety power equipment (rechargeable batteries with rectifiers, inverters and diesel units with associated divisions), command-protection equipment, telecommunication equipment, as well as all necessary home installations.

Facility for own consumpion is powered through a power distribution grid, over a voltage level of 10 kV. The connection is performed by air (cable), according to the Investor's definition along the roadway of the Drmno-Bradarac-Kličevac road (Figure 3.11 - red line). The length of the 10 kV supply line that needs to be built is 6.1 km.

***Figure 3.11**. Own consumption line*

The 10kV distribution system is in the form of a tin-plated internal installation. It consists of: feeding cells, transformer cells and connecting measuring cells. With the 10 kV distribution, a distribution plant of 0,4 kV is supplied through the transformer 10/0,4 kV. Transformers are dry for internal assembly, power 250(400kVA). The power of the transformer will be selected at later stages of design, when the basic energy equipment is contracted. Transformers are another`s 100% reserve. The safety power supply of the most important consumers at 0,4 kV, 50 Hz, is carried out using a diesel generator, power of 160 kVA, for which a special 0,4 kV distribution is foreseen. The safety supply of the most important consumers on DC voltage is provided through static, automatically controlled rectifiers 400/230V, 50Hz/220V, DC. The source of the safety DC voltage 220V are two rechargeable batteries with a capacity of 420Ah. Sources of the safety continuous voltage 230V, 50Hz are 220kV, DC/230V, 50Hz converters. Reserve power supply is provided via isolating transformer 230/230V, 50Hz.

Electricity produced in wind turbines through a cable network is transmitted up to 35 kV distribution system and further through the transformer 35/110 kV into the electric power system. The configuration of the cable network is conditioned by the disposition of the wind turbine pillars, the position of the substation and the 35kV facility. The type and cross-section of the cable network will be selected based on the load on the circuit, according to a separate calculation. The cables are freely laid into the ground in cable trunks, according to the applicable norms, standards and technical recommendations for such equipment. In addition to the cables, all necessary equipment for cable extension, cable endings as well as equipment for protection and marking of cables are foreseen.

In addition to the cable installation, an optical cable network in the field of a wind farm is envisaged, which aims to enable the transmission of information between the wind turbines in the field and the central control system located in the administrative building of the wind

farm. The laying of optical cables is provided in the same trunks with power cables in the appropriate protective pipes or otherwise in accordance with the technology and technical conditions of the transmission system operator.

Transport and traffic description

Temporary delivery point

The transport of the equipment of the wind turbine (blade, gondola, pillar, rotor, etc.) is planned by water and ground road. By water, the equipment will be transported from the production facilities of the selected producer to the temporary delivery point (TDP) at the confluence of the Mlava River to the Danube. At the TDP site, the unloading is carried out by a crane, or a newly installed crane in a temporary port in the deeper riverbed of the Topla Mlava River. From TDP, the equipment is further transported by road on the reconstructed existing road along the defensive embankment on the right bank of the Mlava River to the Kostolac-B TPP (TEKO-B) where temporary storage of the wind turbines equipment will be established. From the temporary warehouse, the equipment is further transported by road to the individual locations of each of the wind turbines. The loading of equipment must not be carried out in the period from mid-March to the end of June and from the beginning of October to the end of November, during the migration and nesting cycle of birds. Examination and verification of the possibility of transporting equipment along the embankment was carried out and elaborated in the Study on geotechnical conditions for the use and reconstruction of embankment and plateau for the need of the preparation of the technical documentation of the Preliminary Design with the Feasibility study for the construction of the wind farm in Kostolac with an analysis of the temporary delivery point at the confluence of the hot water channel and the Mlava River in the Danube and the embankment for the need of transport of equipment of the wind farm (Geomehanika doo, 2016).

Depending on the location of the wind farm (Petka, Ćirikovac, Kostolac and Drmno) from the temporary warehouse, the transport of equipment is further planned using different existing and planned traffic surfaces, and below are given descriptions of the planned transport route by locations:

For the Drmno locality, transport from a temporary warehouse to Drmno is planned using the existing asphalt road TEKO-B - Drmno, which bypasses Drmno village. From the asphalt road, the locality of Drmno is directly accessible, and it is necessary to adapt and build new access roads, which will provide access to wind turbines no. 1, 2, 3, 4, 5, 6 and 7.

For the locations of Klenovnik, Ćirikovac and Petka route is planned to bypass as far as possible the use of inhabited zones, which, as a rule, have numerous limitations for the transport of equipment (low-altitude electricity cables from the traffic area, insufficient radii of curves for wind turbine equipment, etc.). In accordance with the above, the planned route starts from TEKO-B, over the existing bridge on Mlava, along the Mlava River and near the football field on km 5 + 909.00 comes to underpass of the existing coal conveyor belt on the line TEKO-A - TEKO-B, where the level it is lowered (buried) to allow the passage below the pipeline, and hence to the location Klenovnik with a rise of 6% to a relatively flat surface formed by filling of tailings. In this part, the access road for the delivery of the wind turbine equipment will pass over a hot water pipeline which must be secured by the construction of a concrete substrate or be moved if necessary. After mastering the climb, one part of the road

goes along the conveyor belt in the direction of TEKO-A (west), from where it further branches to the individual positions of the wind farm 18, 19 (south) and 20 (north), while the other branch of the road goes south, along the Požarevačka greda from the position of the wind turbine, no. 17, through no. 16 and SS to position no. 15. From wind turbine no. 15 traffic line descends southwest along the periphery of the surface mine in the prescribed slope to the Ćirikovac locality and further south-eastwards by the route of the existing access roads to the wind turbine no. 11, 12, 13 and 14, ending with no. 11. From the location where the administrative building of SM Ćirikovac is located, by crossing the existing asphalt road Požarevac-Kostolac, it is possible to access the locality of Petka, where it is necessary to overcome the rise and bridging of the existing hot water pipeline and continue to reach the individual positions of the wind turbines 8, 9 and 10.

For the needs of assessing the usability of the existing defensive embankment for the transport of the planned wind farm equipment, as well as the possibilities of using the existing concrete plateaus as a temporary deliveri point, field and laboratory testing were carried out. On these jobs were engaged expert teams of companies "Geoput" Ltd. and "Geomehanika" Ltd. The works were carried out in the period from 09.05.-15.05.2016.

Embankment is mainly made of clay dust, brown to brown-gray, with a thickness of approximately 2.00 - 4.00 m. They are well consolidated, naturally moist, tough and poorly waterproof. In the substrate of the filled material there are alluvial sediments, fission of the inlet, and deeper riverbed "*ap*". In the roof area there are dusts of clay to gray clay dust, saturated with water, medium to soft plastic. Deeper dust sand lie, below them are dust gravel, registered with drilling of the concrete plateau and the CPT experiment. In the field were carried out:

1. 23 exploration drills
2. 9 exploration pits
3. 7 experiments of static penetration of CPT until exhaustion of nominal penetrometric force of 20 t.
4. 10 DCP experiments
5. 27 experiments with a light dropping weight.

Groundwater level is determined at a depth of 4.5-4.90 m from the surface of the road on the embankment, which corresponds to an angle of about 69.90-70.00 magl, that is, the level of Topla Mlava at the moment of carrying out of the exploration works. The allowed soil load is calculated according to method K. Tercagi for reinforced concrete slabs measuring 4.00 x 4.00 m. The values of Qa = 174 kN/m^2 were obtained, and this value meets the requirements of safe equipment handling. The analysis of the stability of the slopes of the embankment resulted in great security factors, even with the introduction of an extremely high load of 100 kN/m^2. The planum or embankment crown has the potential to receive a higher traffic load, but with the necessary minimum meliorative interventions in the form of replacing the surface material with a stone aggregate and preparing the bed of the road according to valid standards and regulations. The slopes of the embankments are stable even under heavy loads and it is not necessary to undertake any special measures to increase the stability of the slopes of the defensive embankment.
The conclusion is that: there are favorable geomechanical conditions for the use of a transshipment site and the embankment of Topla Mlava for the needs of transport of future wind farm equipment in Kostolac, within the frames of the adopted constructive parameters related to the facilities.

Docking bay „Kostolac“

In addition to the temporary delivery point, use the future "Kostolac" docking bay for the river transport of limestone, from the quarry "Jelenska stena" near Golupac to the Kostolac B TPP, equipment and the removal of ash, gypsum, etc. is planned as a place of delivery of the equipment of the future wind power plant "Kostolac"

Based on the Main design of the Port “Kostolac”, the project is done for the zone "A"- Docking bay for own needs of EPS - TE-KO Kostolac. In the Conceptual Design, it was designed as a basin, with two opposite quays - two operational banks. It is located in the former Danubian channel “Dunavac”, which is connected with the Danube by the Kostolac canal.

According to the purpose of the docking bay, it belongs to industrial ports, (Article 239 of the Law on Navigation and Ports on Inland Waterways - "Official Gazette of the Republic of Serbia" No. 73/10). As such, the docking bay is planned for the needs of river transport of TPP "Kostolac".

The docking bay has the following basic contents and functions:
• overloading - manipulative contents for river and road transport systems;
• temporary warehouses and landfills - distribution functions;
• administrative complex, including river police facilities;
• technical service for handling transport, manipulative and other means.

The dimensioning of the required capacities as well as the organization of work on the docking bay are provided in accordance with the need to perform named functions and the given types and quantity of cargo transhipment in the docking bay.

The location of the docking bay will be located on the "Dunavac" section east of the Kostolac channel. It is connected with the Danube by Kostolac channel, length about 1440 m. The entrance to Kostolac channel is at km 1094 + 500 survey mark of the Danube waterway.

Part of the "Dunavac", on which the aquatorium will be formed, and banks on which the docking bay will be built, has a form of a bay that closes the "Dunavac" at its eastern end. The two opposite banks are different. On the north side, the slope embarkment with concrete revetment was built (Figure 3.12.). This bank is in function of the dock, with embedded bollards on the top edge and a built concrete ramp for pulling/lowering of the boats. Along the bank the river police pontoon is connected. On the bank there is a concrete plateau and several ground buildings. This bank is supplied with electrical and plumbing installations. In addition to the connections of the river police pontoon, all these facilities are abandoned and out of use. The rest of the bank is covered with trees, shrub and other vegetation. Level of the bank is about 72 masl, i.e. in the zone of flooding at the time of extremely high Danube water levels.

Figure 3.12. *North side of the channel*

The bank on the opposite side of the "Dunavac" is steep, high, with level over 76 masl, on the periphery of the slope, a fence of the TPP Kostolac "A" is put. The slope is covered with vegetation. From the buildings on the slope of the bank, there is one concrete outlet from the direction of the TPP, while downstream of the docking bay area, a abstraction construction site and a pumping station for technical water TPP are located. Upstream from this pumping station there is a distribution plant TPP Kostolac "A". From this facility starts the branching of the transmission lines that crosses the "Dunavac" on the opposite bank. These transmission lines are under the jurisdiction of PE "Elektromreža Srbije" (EMS). As a part of the maneuvering docking bay is located under the transmission line, reconstruction is needed to overcome the individual power lines, in order to ensure a proper distance for the vessels.

At the height of the water cut on the level 70,20 masl, i.e. at water levels that last about 70% of the time on average annually, this bay is about 90m wide and about 150m long. The bottom is about 65 msl, except at the upstream area where they are heigher and transit in the mild slope of the bank. Here the bank and the bank belt covered with low marsh vegetation.

Over the site passes the local road - Kneza Lazara St., which connects the settlement built downstream along the Kostolac Canal and the Danube, with the central part of Kostolac. In this roadway, electrical and plumbing are installed. The traffic connection of the docking bay with the complex TPP "Kostolac B" is the existing road to the settlement Stari Kostolac and beyond, over the bridge on Mlava river to the TPP "Kostolac B". Road transport length is about 3,6 km. From the entrance to the docking bay to the access to the mentioned road, Kneza Lazara St. will be used as an external access road. For this purpose, at a length of about

450 m, this road is intended for reconstruction, and a part of the route leading over the docking bay will be removed from the docking bay.

Transportation of equipment from the future docking bay to specific locations Drmno, Petka, Ćirikovac and Klenovnik will depend on the selected manufacturer / supplier of equipment.

Remote control and monitoring system

Wind farm operation will be done from the operating building using appropriate monitoring room with central monitoring system. This system will be connected with each of the turbines using optical cable networking. Each turbine with the generator is supplied with its' own operating system. Functions of such system include the following:

- monitoring and supervision of the production
- generator synchronization with the grid
- wind turbine operation during restricted operation conditions
- automatic rotation of the nacelle
- blade feathering
- turbine curtailment
- noise control
- ambient control
- grid monitoring
- fire protection monitoring

Grounding and lighting system

Grounding system of the wind turbine consists from ring and foundation grounding parts. Mutual grounding part is incorporated foundation grounding system made from galvanized Fe/Zn ribbon 24x4mm placed in the concrete of the foundation and welded partially for the reinforced steel framework of the foundation. Total grounding resistance is calculated as a sum of parallel impedance of foundation grounding, ring grounding and parallel impedance of the cables between the turbines. Grounding system may be done in other way (according to the manufacturer) if it fulfills required parameters. Grounding system is provided for administrative building of the 110 kV distribution system with relay housing and administrative buiding of the wind farm.

Lighting system (external lighting) is planned for substation complex with the administrative building. Obstruction lighting system for the wind turbines have to be in accordance with Civil Aviation Directorate; in case where different obstruction lighting systems may be selected, and according to the results of birds and bats monitoring study, the system which affects birds and bats in the smallest amount should be selected, so potential mortality should be reduced.

Aspects of the project related to the impact on the environment

In terms of previous works, they have not been implemented in physical terms. First of all, it is possible to talk about preliminary (preparatory) actions, which are related to the preparation of planning and project documentation and obtaining the conditions of the competent institutions in the regular procedure and other documentation necessary for the start of the construction of a wind farm. In addition, property-legal relations over land have been solved

as one of the basic preconditions for commencement of construction. Due to the specific nature of the construction of a wind farm, it is not possible to speak precisely about the quantities of raw materials, construction materials, and waste materials by "technological units". Namely, almost the whole process of building a wind farm is based only on the assembly of objects/wind turbines that are delivered to the site in parts. Certain quantities of material and water will be used for foundation of the wind turbine pillars and construction of the SS administrative building, and all surpluses of construction material will be properly shipped from the location that will be defined in the Construction Design.

In the context of gas emissions, it can be talked about the work of construction machines, but it is about the minimum quantities that can not be predicted accurately. Hazardous substances that will be used in the regular operation of the wind farm are (1) hydraulic oils and lubricants, anti-freeze and other chemicals for cleaning and maintenance of wind turbines (necessary for operation) and (2) transformer oil for substation. The use of hazardous substances necessary for the operation of wind turbines are defined by the regulations of the manufacturer which is certified in accordance with the ISO 14001:2004 standard. The amount of oil contained in the lubrication systems in the type of wind turbine projected by the project is slightly more than 1000 liters. The replacement of the oil will be carried out periodically, as part of the regular preventive maintenance of the plant. The Investor has adequate capacities for the disposal and recycling of oils and lubricants within the existing SM Drmno, which will be used for the disposal of materials in the process of exploitation of the wind farm. Transformers are placed on separate foundations with a case. From the cases waterproof oil sewers are provided up to the watertight oil pit. The oil pit capacity is determined by the amount of oil from the transformer. Maintenance of the transformer (and replacement of the oil) will be the responsibility of the Investor.

Regarding the treatment of waste materials, according to the nature of the technological process of the wind farm, one can talk about waste oils in the transformer. In addition, waste will be generated during the construction of a wind farm (construction, utility and other waste), and it must be taken from the location to the designated landfill and in accordance with the propositions of the Law on Waste Management and in cooperation with the competent utility company. As for sanitary wastewater, it is necessary for the personnel involved in the construction to provide portable chemical WSs and their regular maintenance and discharge by an authorized legal entity.

The impact of the wind farm on the environment due to the specificity of the technological process and the application of "clean technology", is reflected above all in the possible impact on ornithofauna and hiropterofauna as the dominant potential impacts. Other impacts are of a temporary character (mainly in the construction phase) and have limited intensity and spatial conditions. Such impacts should not burden the capacity of the space in any segment, especially if the defined environmental protection measures, environmental monitoring and other procedures that will be implemented during the exploitation of the project.

4. REVIEW OF MAIN ALTERNATIVES

Locations of wind generators - The location of wind farms was determined by the performed wind estimation and electricity production in the specific area, as well as the existence of a planned basis, the possibility of solving property-legal relations over land, etc.

Based on these assumptions, the location in question has been identified as favorable. However, despite the basic benefits provided by wind farms, they can have a number of adverse environmental impacts, especially with regard to possible effects on: ornithofauna and hiropterofauna; landscape and ambient values of space; increasing the noise intensity, etc.

In this context, the possible impacts on the ornithofauna and the hiropterofauna of the area of subject and wider area are certainly the dominant ones. Namely, the wider area where the construction of the Kostolac wind farm is planned is characterized by the richness of the flying fauna, not so much at the site itself, as much in its surroundings, i.e. in the area of the Deliblatska peščara, while the Danube River represents a migratory corridor for birds.

In relation to the stated conclusion, in order to minimize possible negative impacts on ornithofauna and hiropterofauna, various alternatives for the spatial disposition of wind turbines have been elaborated in order to optimize the individual wind turbines in this context.

The most effective way to prevent the harmful effects of projects, including wind farm projects, on the birds and bats, is the application of the principle of preventive planning in the function of protecting bats and birds, which implies that the negative impacts of the construction and operation of the project are prevented or reduced to a minimum already during the design/planning phase.

The main alternatives considered by the project holder, taking into account the environmental impact, concerned the spatial disposition of the wind turbine pillars. The aforementioned alternatives were analyzed primarily in the context of the protection of ornithofauna and hiroftofauna, but also from the aspect of other possible environmental impacts. For the determination of the most favorable alternative solutions for the spatial disposition of wind turbine pillars, a special contribution was achieved through the results of a one-year monitoring of ornithofauna and hyropterofauna whose results are shown in section 2.3. of of the Study.

On the recommendation of the implementers of this monitoring, PE EPS adopted the principle of preventive planning from the very beginning of the monitoring of flying fauna - as a result of the findings and recommendations of the preliminary analysis of the conflicts carried out in the preparation of the preliminary Report on the performed analysis of the existing documentation. At the very beginning of the monitoring, plan of the wind farm, ie. changes in the position of individual wind turbines were made (Figure 4.1), in the direct function of preventing the harmful effects of the project on birds and bats.

Figure 4.1. *Changes in the spatial disposition of the wind turbines as a result of the analysis of potential conflicts with the flying fauna (red - the position of the wind generators according to GD, yellow - the position of the wind turbines after the conducted monitoring of the flying fauna)*

Preliminary analysis of the conflicts found that the site of Petka was mostly covered with woody-bushy vegetation, with the largest part of its central part characterized by very thick plant stands - thickets, shrubs and young forests, while on its peripheral part there are older, but also dense, coniferous and deciduous stands.

It is estimated that especially these older stands may have the significance of retaining some of the strictly protected species of birds such as Falconiformes and owls, and that the whole site has high trophic potential for bats, which was later confirmed by the findings of this monitoring. Pointing to the explicit position of EUROBATS that wind turbines should not be installed in forests or at a distance of less than 200 m from the forest due to the extremely high risk for all bats, it was concluded that in positions of all wind generators at that moment in the location Petka, according to the General Design, there was a high risk of death of protected and endangered species of birds and bats. Therefore, in order to prevent this potentially very harmful effect, it was proposed to consider the repositioning of these wind turbines into zones where the risk will be smaller and/or where the extensive removal of trees and shrubery on this site will be realized. Such logging is considered acceptable because this vegetation does not have much significance for the conservation of bats and bird fauna in the surrounding area, as there are many natural optimal habitats of this type in the immediate vicinity, and drastically increases the risk of their death.

After the implemented and very extensive additional analyzes that included detailed mapping and assessment of the habitat at the location of Petka, the most optimal solution was reached (Figure 4.1) - the position of the VG11 wind generator, previously planned in the zone of a larger continuous thicket in the south of the location of Petka, was transferred to the location of Ćirikovac (in the safe environment of open ruder habitats, as confirmed by this monitoring), the positions VG08 and VG09 are moved to a safe distance from the older stands on the slopes, and in all positions complete remove of shrubs and woody vegetation is

planned in the entire areas of wind turbines for the smooth functioning of the wind turbines and security areas of 200 m around them, which is considered as the general measures for risk reduction which are carried out at all positions of wind turbines.

At the site of Klenovnik, preliminary analysis of the conflicts pointed to the existence of pockets of deposited tailing material in zone of closed mine where ponds were formed with a large complex of aquatic, marsh and humid habitats. Expected, and confirmed by this monitoring, these habitats are attracted by birds of aquatic habitats, insects and bats, and they also represent significant watering place on the site, which is why they have the significance for retaining and taking place of the life cycle of birds and bats. Therefore, it was concluded that in the position of the VG18 wind generator, which according to the General design was at that location, there was a high risk of death of the protected and endangered bird species and bats in this zone. To prevent this potentially highly detrimental effect, it was suggested and accepted by reposition the VG18 out of the risk zone (Figure 4.1). It was considered possible to dry out these ponds and reconfiguration, i.e. even out the tailings material in order to prevent the future accumulation of water and the formation of such habitats; this would reduce the risk of deaths, and the loss of this habitat would not have a significant negative impact since there are a large number of optimal natural habitats of this type in the immediate soroundings.

Variant solutions of the temorary delivery point (TDP)- According to the Law on Navigation and Ports on Inland Waterways (Official Gazette of RS No. 73/2010), it is possible to establish a temporary delivery point where the goods would be storaged and further forwarded. The duration of the granted authorization can not be longer than a year and it is necessary to contact the institutions referred to in paragraph 2, Art. 240 of the Law on Navigation and Ports on Inland Waterways for the purpose of issuing the conditions under which a temporary delivery point may be created. According to the above legal provisions, the Temporary Delivery Point shall be established upon the approval of the Agency for the Administration of Ports with the prior consent of the Ministry competent for water management, the competent authority of the local government unit, the Directorate i.e. an authorized legal entity for the technical maintenance of state waterways, or an authorized legal entity for technical maintenance state waterways in the territory of the Autonomous Province and Port Authority.

The variant solutions for the transhipment of the wind turbine equipment include the following or the combination of the following options:

1. The use of a temporary crane on the TDP for the loading of barges/ships, and the same crane will later be used for the instalation of the wind turbines;
2. Use of ships/barges with crane, or their combination, if it is not possible to access the TDP by a larger ship;
3. Use of ships/barges with crane with supports, in the event that the riverbed of the Topla Mlava, and if the water level causes the ship/barge to become trained, i.e. additional factors of uncertainty regarding stability and functionality;
4. Use of the pontoon bridge or platform as a pre-access part of TDP, which should be combined with one of the above mentioned variants.

1. Installation of crane on the existing plateau – for loading is used mobile crawler crane, which is later moved to a new place of loading (place of instalation or similar). Data on the gauze depth of the water surface are elaborated in the Study on geotechnical usage conditions and reconstruction of embankments and plateaus for the purpose of making technical

documentation Preliminary design with the feasibility study of consrtuction of a wind park in Kostolac with the analysis of temporary delivery point at the confluence of the channel of hot water and the river Mlava and the Danube and embankment for wind farm equipment transport (Geomehanika doo, 2016.) and indicate shallow draught. Figure 4.2 preliminarily identifies similar conditions as with TDP in Kostolac.

Figure 4.2. *Transhipment of a transformer from the river barge on Nile (Egypt) (mass of the transformer about 150 tons)*

2. Using the ship or barge with crane - for this type of transport, it remains unresolved whether it can access the TDP due to its characteristics, but this or similar ship (Figure 4.3) can be used to deliver equipment to the confluence of the Hot Mlava in the Danube.

Figure 4.3. *The crane ship transports the equipment of the wind turbine*

In Figure 4.4. a barge with self-supporting crane for wind turbine equipment lifting is shown (the picture shows blades). Such equipment works in the way that from a larger vessel by its own crane, equipment can be transshipped on such barge, and then the barge is drawn to a transhipment site, the equipment is lifted through a self- supporting crane and vehicle that will accept the cargo goes underneath it, and transported further (see Figure 4.7.) (where the stator's load is placed on a towing vehicle). Such barges are conviniant for partial unloading of equipment (individual elements) because they can access various terrains due to the relatively low load capacity and shallow gauze. The details of their use will depend on the particular transport case, which for this analysis also depends on the general transport to the TDP (whether the equipment will arrive by boat or barges, with or without cranes, etc.). Crane on this barge is not a classic type and through it the equipment can not be transshipped out of the barge.

Figure 4.4. *Barges with self-supporting crane for the transhipment of wind turbine equipment*

3. Use of a ship or barge with a crane and supports - This type of transport and transhipment is typical of offshore wind farms. The construction technology for this type of wind farm presupposes ensuring stability of the crane on the water surface (Figure 4.5), which in practice means establishing contact with the bottom of the water surface. This ensures the safety and stability required for instalation of the equipment, as well as the safety and reliability of the work. The following pictures show the listed cases.

Figure 4.5*. The ship with crane and supports mounting and transporting of wind turbines*

In the case of TDP near Kostolac, it is expected to use equipment of smaller load, due to the possibility of transporting such equipment and the price/justification of the works. In the following figure, a sketch of the barge is provided with the supports and the crawler for the loading of the equipment.

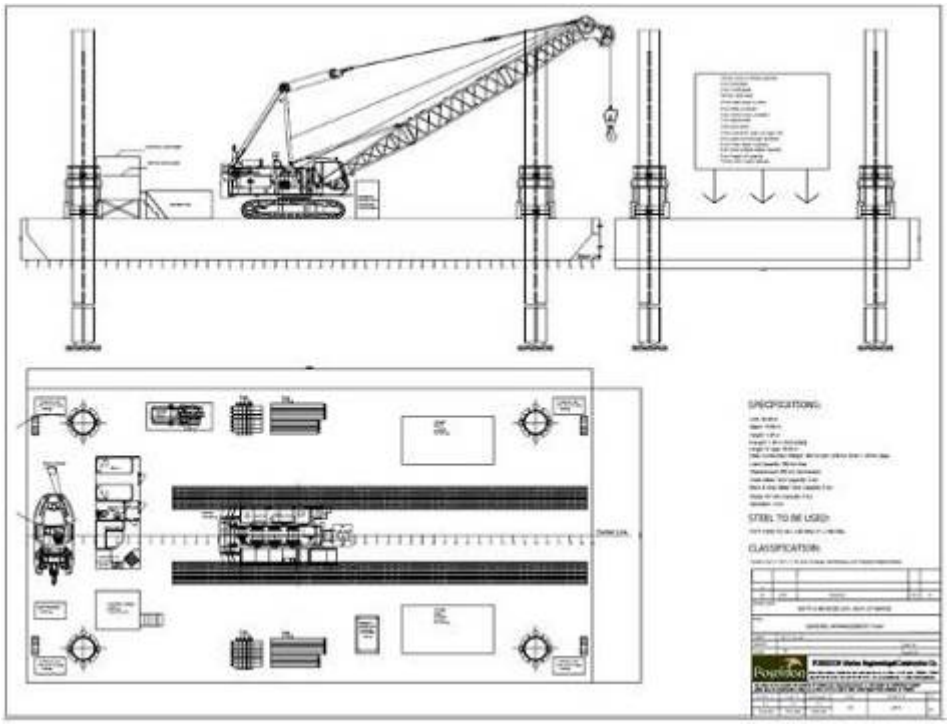


***Figure 4.6**. Disposition of the barge with supports and cranes on it*

Such equipment can be used in cases where the use of a crane on the existing plateau is not planned or it is not possible to access TDP by the ship/barge with the crane; in such cases, the equipment is delivered in one of the previously described ways and through such a barge transhipted to TDP, ie vehicles that will be positioned on the TDP for the acceptance of the cargo. Such a solution can be adopted as acceptable if the depth of the gauze in the existing TDP is not sufficient for access of the vessels with the intended cargo, and secures the distance to the middle of the riverbed (and a greater depth of draught), using temporary equipment which will be disassembled and sail after the the transhipment is completed.

4. Use of the pontoon bridge/barge - The use of a pontoon bridge or barge is a solution that can be used in combination of insufficiently deep gauze and ships/barges with conveyor cranes. Such a solution is aplicable to direct loading of loads on towing vehicles to be connected to a tractor or other suitable vehicle capable of further carrying cargo. In Figure 4.7. an example of this solution of a stator of an approximate weight of about 400 tons transported at the site of Thailand. The dimensions of this stator are approximately the same dimensions of the wind turbine gondola, but the mass is about five times bigger.

***Figure 4.7.** Pontoon bridge/barge with a stator load of about 400 tons*

Summary of the variant solutions for TDP - It should be noted that the final variant of TDP solution will depend on the manufacturer/supplier of the equipment. It is possible to apply individual variant solutions, as well as a combination of the mentioned variants. The preliminary assessment concludes that the entire equipment of the wind farm (more precisely - wind turbines) will be delivered to the confluence of the Hot Mlava in the Danube, and then transported by a smaller barge/ship to the TDP where the overloading will be carried out. The exact way of transhipment will be subsequently determined according to the primary and main cargo, the capacity of the Topla Mlava gauze during the period of cargo deliery (May-September) and the mass and gabarit of the contracted equipment for delivery. When selecting the method of transhipment, the timing of the technical solution should be taken into account – forming of TDP is conducted for a period of one year, and due to the specific opinion of the Institute for Nature Protection, the transshipment cannot be carried out only during the period from the half of March to the end of June and from the beginning of October to the end November, at the time of the migration and breeding cycle of birds. This means that preparatory actions such as adjustment of the plateau (if necessary), and in particular the provision of administrative permits and approvals in a timely manner in order for the TDP woud be in operation at the beginning of an approved period of exploitation. The proposed variant solutions should be harmonized with the manufacturer/supplier of the equipment in order to obtain credible data on the technical solution based on which the competent authorities will issue the approvals.

Technology and working methods - Wind farms can play an important role in the energy system of a country. In addition to certain negative impacts that can have on environmental elements, wind farms also imply numerous benefits in relation to the quality of the environment. Thanks to their constructive and operational characteristics, they produce electricity in an ecologically clean way, and it is known that every kW of electricity produced from renewable sources represents kW less energy from non-renewable sources, which production often requires devastation and degradation of large land surfaces which disturbs the quality of the environment and has a marked negative impact on biodiversity, and also on the health of the population in the influential area. In practice, there are no significant differences in the technological process and methods of work itself, and different variants in this respect are not significant. However, the possibility of placing a larger number of wind turnines of less installed power, on the one hand, and a lower number of wind turbines of greater power, on the other hand, was considered. Taking into account the economic and ecological benefits, the decision of investors was for the second variant.

Site map - The results of one-year observations of ornithofauna and hiropterofauna have been consulted for the selection of microlocation of wind turbines, thus applying the principle of preventive protection of the flying fauna, which is considered the most dominant influence of the wind farm.

Type and selection of materials - The wind farm, according to its structural and energy elements, is a typical, constructional and technical-technological solution, where it is known in advance which type of material is used. Materials for construction are delivered by the selected manufacturer. These are parts of wind generators that are assembled at the site itself. In that sense, one can only be discused about the choice of equipment manufacturers and the choice of materials that is always the same or similar (steel, concrete or hybrid), and the decision to choose a company is based primarily on the quality of the equipment that produces steel pillars that require a smaller quantity materials for the same characteristics. In addition,

the choice of concrete pillars could involve spilling parts of pillars on the site itself, which is less favorable from the aspect of environmental protection.

Timetable for the execution of the project - The order of works is: 1. Construction of the foundation, 2. Electrical works, 3. Access roads and work plateaus, 4. Transport of the equipment and 5. Installation of equipment. The dynamics and eventual changes in the order of execution of the works are directly conditioned by the dynamics of development of project technical documentation and the provision of appropriate documentation necessary for the start of the construction.

Functioning and cessation of operation - The working life of the wind farm is from 20 to 25 years. When the working life is nearing its end, it will be assessed whether the wind farm should stop working and be removed or turbine replacement will be made. There are various options: general overhaul and equipment renewal for extended service life, turbine replacement, etc. These alternatives will be considered in accordance with the circumstances that will exist at the time.

Date of commencement and completion of the execution - The framework period for the works on the construction of the wind farm is from 2018 until the end of 2020. Alternate dates will be determined in accordance with the dynamics of obtaining the appropriate documentation needed to the construction start.

Production volume - The production volume will depend on the wind speed during the year, and is directly conditioned by the choice of wind turbines, ie the height of the pillar and the diameter of the rotor (blade).

Pollution control - Power transformers for the Kostolac wind farm are not manufactured as dry transformers, so in that context there were no alternative solutions. Continuous monitoring of the condition of the devices containing oil and periodic testing and replacement of oil is foreseen.

Disposal of waste - Disposal of waste generated during the construction of a wind farm will be disposed in accordance with the provisions of the Law on Waste Management and in accordance with defined *Waste Management Measures*, which will be implemented in the Detailed design and is not the subject of this Study.

Responsibility and procedures for environmental management, training, monitoring, emergency plans - After the construction of a wind farm, a responsible person will be chosen who will be trained for carrying out tasks and implementation of procedures related to environmental management and monitoring of the operation of the wind farm. In addition, the Emergency Plan, or the Accident Plan, will be developed and implemented in a manner as presented in the section of the *Accident Protection Measure*.

Mode of decomision, regeneration of the site and further use - Planned working life of the wind farm is about 25 years. After this period, unless the decision on the extension of the working life of the wind farm is made, the plant will be closed and removed. Before the removal of the plant begins, it will be necessary to make a project for closing and removing of the wind farm that will include a detailed plan for the rehabilitation of the previous wind farm area. As part of the project, it will be necessary to formally establish a list of protective measures and requirements that need to be met, based on possible specific conditions that may

arise at that time. The mentioned project will need to be harmonized with the Conditions issued by the competent institutions. The project with a recovery plan should be accepted by the competent environmental authority as well as all other stakeholders (including the financial institutions that participate in the project financing). In addition, the defined *Measures of prevention and mitigation during the closure of the wind farm* will be implemented.

5. REPRESENTATION OF THE ENVIRONMENTAL STATE

The environmental quality of the area where the construction of the Kostolac wind farm is planned is influenced by several different industrial complexes: TPP Kostolac A (two power blocks of 110 and 210 MW), TPP Kostolac B (two power blocks of 348.5 MW each), surface lignite mine Drmno, ash and slag landfills at the locations of the Kostolac Middle Island and Ćirikovac, as well as local sources of pollution within the settlements Stari i Novi Kostolac, Petka, Bradarac, Klenovnik, Klicevac, Drmno. Since the implementation of the technological process of using eol energy in wind farms does not imply negative impacts on the quality of the basic environmental factors (water, air and soil), these environmental factors will be described descriptively with the status score. Data on the quality of the basic environmental factors (air, land, water) were taken from the Environmental Report of PE EPS.

Air - The most important air pollutant emitters in the area of interest are TPP Kostolac A and B. In order to monitor and control the emission of pollutants, TPP Kostolac A and B have developed systems for continuous monitoring of emissions into the air for pollutants that are regulated by appropriate regulations, i.e. for sulfur dioxide, nitrogen oxides and PMs. At the time of design and construction on the blocks of TPP Kostolac A and B, no measures were taken to reduce air emissions, except for electro-filter plants, since at that time the emission limit values (ELV) were not prescribed, but the impact on air quality was assessed on the basis the imision values of certain pollutants in the vicinity of the TPP. In the past period, after the adoption of the regulation on ELV in the air, as the first measure in order to harmonize with the set emission limits, reconstruction of the electro-filter plants was carried out at the mentioned power plants, which contributed to a significant reduction in emissions of PMs through gas. Individual measurements of air pollutant emissions in 2016 confirmed the deviation of mass concentrations of PMs at the exit from electro-filters in relation to the guarantees of the suppliers, on both blocks of TPP Kostolac A, where the increased gas temperature at the entrance to the electrofilters in relative to the projected values. The obligation to examine all parameters influencing the efficiency of the EF operation was undertaken in order to take appropriate measures in order to improve the efficiency of the EF operation in TPP Kostolac A. Mass concentrations of SO_2 in gas are significantly above the ELVs prescribed by RS and EU regulations. In order to reduce the emissions of sulfur oxides, it is planned to install gas desulphurization plants according to the agreed dynamics defined with the European Commission. Environmental impact assessment study of the gas desulphurization plant TPP Kostolac B was carried out (which was approved by the Ministry of Environment in August 2015). Also, construction of desulphurization plant at TPP Kostolac B is in progress.

Soil – The TPP Kostolac branch has been monitoring the quality of land every two years in the past period, and since 2015 every year. During 2012, measurements were carried out in the wider area of the company, which covers about 450 km^2. The results of these tests indicate that the average value of the total content of heavy metals in the soil of the test area is common for agricultural land. The total content of most heavy metals such as zinc (Zn), mercury (Hg), lead (Pb), cadmium (Cd), copper (Cu) does not exceed the threshold limit value (TLV) in none of the samples. The total content of arsenic (As) and chromium (Cr) in two samples ate above the TLV while nickel (Ni) is in 40% of the samples above the TLV. The program of soil control includes: field and laboratory measurements at representative measuring points that are entered on the topographic map, which will enable monitoring of the changes of the tested parameters at the same measuring points in the following period.

The tests are carried out 2 times a year. Measuring points are defined depending on the distance from the landfill:

- from the landfill (ash),
- in the influence zone: zone 1 – up to 1 km to landfill, zone 2 – from 1 km to 3 km to landfill and zone 3 – from 3 km to 5 km to landfill,
- outside landfill impact zone (control points).

Regarding the content of heavy metals, the exceedance of nickel content in relation to TLV in 25 soil samples in the vicinity of each landfill has been recorded, as well as exceeding the lead content in two samples around each landfill. For other analyzed substances, no exceedance was recorded in any sample. The content of heavy metals and other toxic elements in ash and soil was in the usual concentrations and below the remediation values for: chromium (Cr), cadmium (Cd), mercury (Hg), arsenic (As) and iron (Fe). Measured values are far below remediation, when sanation measures are required. Taking into consideration all the results of the soil survey, it can be concluded that the investigated area is not polluted by most heavy metals. As a more pronounced pollutant, nickel (Ni) occurs, whose high content is largely determined by the geochemical composition of the parent substrate. Also, the differences in the average values of metals by zones do not clearly indicate the impact of the distance from the pollutant to the content of the pollutants, especially due to the large variation in values within the same zone.

Water - The program of quality control of surface and wastewater in the area under the influence of TPP Kostolac includes measurements of physico-chemical, bacteriological and radiological parameters: air and water temperature, turbidity, pH, el. conductivity, soluble O2, saturated O2 %, COD BOD5, residual evaporation of unfiltered water, residual evaporation of filtered water, total suspended matter, sedimentary matter, total surfactants, mineral oils, phenols, alkalinity, F, Cl, NO2, NO3, PO4, NH4, Ca, Mg, hardness, Al, Fe, Mn, Cd, Cr6 +, total Cr, Cu, Ni, Zn, Pb, Hg, As, B, and ß activity, microbiological analysis. Control includes: wastewater at the place of production and/or the discharge point in the river and/or discharging into the heat channel; and waters of the river - water recipient on the profiles upstream and downstream from the waste water discharge site. By analyzing the data, it can be concluded that Mlava does not suffer significant negative impacts of TPP Kostolac B, because the concentrations of pollutants are below the TLV. The most significant adverse impacts of ash and slag landfills come from arsenic and sulphates that migrate from the deposited mass into underground and surface waters. Sulphate ion migrates quickly and is considered an excellent indicator of pollution of groundwater due to the operation of the landfill. Measurement of pollutants in groundwater was carried out in pyrometers in the landfill area. The water temperature in Mlava downstream of the waste water influent from the TPP Kostolac B increased on average by 1^{o}C, and after the Mlava flows into the Danube, the water temperature in the Danube did not change.

Noise - The occurrence of noise which is registered further from the main building of the TPP Kostolac B is created by the regular operation of the blocks, especially when blocks are moving as well as in special situations during regular operation (activation of the safety valve). Another source of noise, which is manifested at the very location of the planned Kostolac wind farm, comes from the roads connecting the settlements in the zone of the wind farm and, to a lesser extent, from the conveyor belt that crosses the location. Measurement of noise was carried out in 2014 at six measuring points: TEKO A - River police, FIO Minel, TEKO B - Viminacium, Zatvaracnica at Mlava and SM Drmno - Vidikovac, the road to Kličevac, of which the most significant measuring points are the last two for the Kostolac

wind farm. Measurements were performed during the summer period during the day and night, and the measurement results show that the relevant noise level exceeds the values of 50 dB (A) at all measuring points except at the measuring point "FIO Minel" and "road to Klicevac", whereby the highest value recorded was at the Viminacium measuring site.

Population - At the periphery of the area that is located in the scope of the planned wind farm project, there are several settlements - Kostolac, Drmno, Bradarac, Maljurevac, Ćirikovac, Petka and Klenovnik, as well as the complexes of administrative and/or industrial facilities of Thermoelectric power plants and mines Kostolac. The settlements are mainly agricultural households, and the project of the wind farm will not significantly impede the usual agricultural activities in the area in question.

Flying fauna - During the twelve-month monitoring at the site, the presence of 119 bird species was detected (120 in the entire research area, which, in addition to the subject, would include control), most of which were in low numbers. As mentioned earlier, the greatest reason for the low number of specimens of recorded species in the investigated area is the extreme uniformity and the presence of sub-optimal habitats. there are almost no trees, as well as the middle floor vegetation (shrubs). For the investigated area characteristic are species that live on the ground. Of the species that would have potential damage from the wind generators, 17 target species were selected, which were specifically monitored and recorded. The extent, the height and the directions of the flyovers speak about the potentially low effect and the intensity of any damage. Certain effects of wind turbine functioning can be assumed for some species of Falconiformes that were the most numerous target species and recorded at critical heights such as *Buteo Buteo* and *Falco tinnunculus*. Other species, such as *Circus aeruginosus*, *Accipiter gentilis, Accipiter nisus, Ciconia ciconia, and Falco subbuteo*, were significantly less numerous and were flying at different heights from the surface but mostly up to 50m, a height that would be beyond the reach of the future blades of the wind turbine generator. The nesting of almost all kinds of predators has not been established, except for the most numerous - *Buteo buteo and Falco tinnunculus*. The most significant number of flights was recorded for the two species mentioned, while the number of overflights recorded by other species is significant or extremely small. Based on the foreseen layout of wind turbines on the future Kostolac wind farm and on the basis of data at the observation points, it can also be assumed that the will not be significant negative impact of the construction and operation of the wind farm on the bird fauna.

At the location of the wind farm with ultrasound audiodetection, the activity of 14 species of bats is registered, whose members can be reliably distinguished on the basis of echolocation signals: *Rhinolophus ferrumequinum*, *Miniopterus schreibersii*, *Myotis bechsteinii*, *Myotis emarginatus*, *Myotis nattereri*, *Barbastella barbastellus*, *Pipistrellus pygmaeus*, *Pipistrellus pipistrellus*, *Pipistrellus kuhlii*, *Pipistrellus nathusii*, *Hypsugo savii, Nyctalus leisleri*, *Nyctalus noctula*, *Vespertilio murinus* and *Eptesicus serotinus*. In addition to these, the activity of representatives of 4 groups of species whose members cannot be reliably distinguished on the basis of echolocation signals is also registered- so it is certain that at least one species from each of these groups is present at the site, which makes at least a total of 19. However, it is very likely that this number is actually higher, i.e. 23, because at least occasionally and/or sporadic there is the presence of 8 species from these groups (*Myotis brandtii*, *M. mystacinus*, *M. alcathoe*, *M. myotis*, *M. oxygnathus*, *M. daubentonii Plecotus austriacus* and *P. auritus*) almost certainly based on their wider distribution and the existence of appropriate ecological conditions at the site and in the immediate vicinity.

Climatic characteristics - Based on the analyzed climatic conditions, it can be concluded that the area of the planned wind farm Kostolac has a moderate-continental climate with certain specificities. The transition season, spring and autumn, are distinguished by the variability of the weather, with the warmer autumn of the spring. In the summer, due to the movement of the subtropical high-pressure belt to the north, this area is under the influence of the so-called Azores anticicyclone, with fairly stable weather conditions and occasional spillovers of local character. In winter, this area is under the influence of cyclonic activity from the Atlantic Ocean and the Mediterranean Sea, as well as winter so called Siberian anticyclone. Data on air flow characteristics, from measuring points at the location of the planned wind farm Kostolac, are presented in point 2.2.3. of the Study.

Buildings, cultural haritage, archaeological sites and ambient units - In the context of the architectural heritage and cultural values of the location concerned, the objects of settlement structures on the perimeter of the site and the sites identified in point 2.4 of this Study can be discussed. There are no significant ambient units on the location in question.

Landscape - Due to the dominant effect of anthropogenic factors on the site, primarily mining activities, the landscape values of the site can be characterized as low quality. The anthropogenic altered areas altered by the mining activities in the previous period dominate, and the objects of thermal power plants dominate the space in a visual sense.

Relationship between named factors - In summary, it can be noted that the quality of the basic environmental factors at the microlocation of the planned wind farm Kostolac is somewhat distorted as a result of primarily mining activities and the operation of thermal power plants in the environment. However, due to the nature of the technological process in wind farms, there is no significant interaction between the elements of the environment in which, as a result of cumulative and/ or synergetic factors, increased environmental pollution could not occur. Although Article 6 of the Rulebook on the content of the Environmental Impact Assessment Study explicitly states that this chapter must include all the above factors, it should be pointed out that the project concerned, due to the nature of the aforementioned technological procedure, will not have influence on most of the above mentioned environmental elements (climatic characteristics), some elements may have a minor impact (flora, soil, water, air), while the effects on other elements, especially on theflying fauna, can be significant, which is given in more detail further in the Study.

6. DESCRIPTION OF POSSIBLE SIGNIFICANT IMPACTS OF THE PROJECT ON THE ENVIRONMENT

6.1. General assessment of possible environmental impacts

The construction of infrastructure objects may impair the components of the structure of unequal ecosystems. In addition, a negative effect can implicate a number of different factors, with different time and space coverage. Considering the basic purpose of the wind farm facility, the way it operates and the expected environmental impacts, it can be concluded that the following impacts will occur during the construction phase:

- increased noise level due to the operation of construction machines and transport means;
- increased level of air pollution due to emission of exhaust gases from construction machines and transport means;
- temporary deposit of surplus land during the foundation of facilities, stones and other waste materials.

These effects are inevitable in the construction phase and can not be avoided, but they are, for example, level of noise and air pollution during the construction of the wind farm are far lesser than the increased noise and pollution levels obtained by the mining and other mechanization on the surface mine and TPP, which is of significance for the area in question. The possibility of prevention refers to the regular maintenance of means of transport and construction machinery in order to prevent the occurrence of higher noise levels and increased emissions of exhaust gases due to malfunction of means of transport and construction machinery.

In the construction phase, there will be the excavation of smaller quantities of soil, stone and other waste materials from the excavation of foundations for the planned facilities. However, this deposit will be only temporary, and the investor will be obliged to organize the permanent deposit of these materials as soon as possible in accordance with the relevant legislation. Free desposal will be prohibited. The evacuation of the surplus of land, stone and other waste materials during the construction phase will be regularly organized and, if necessary, in cooperation with the competent institutions. Free disposal of these waste materials will be prohibited by measures of environmental protection. Waste magagement during the construction of a wind farm will be defined within the Detailed design and is not the subject of this Study, except for the guidelines that will be defined in that context in Chapter 8 of the Study.

Generally speaking, the implementation of special requirements that ensure the exploitation, maintenance and supervision of the Kostolac wind farm do not condition the removal of facilities, nor the change in the purpose of the land on which the construction of the wind farm is planned.

In addition, since it is about the exploitation of a renewable energy source (wind energy), that is, the application of "clean" technology, no pollution is expected in terms of emission of waste matter into the basic environmental factors (water, air and soil). The realization of the planned project will not produce waste materials nor create other types of pollution. The possibility of occurrence of accidents has been minimized. The facilities will be built on an

optimally prepared terrain and with strict respect for the geomechanical characteristics of the soil.

Nevertheless, the most significant consequences on the quality of the basic factors of the environment and nature can be the following:

- impact on ornithofauna,
- impact on hiropterofauna,
- increase in the noise intensity,
- impact on the characteristics of the landscape,
- shading of the objects,
- accident situations.

Analyzing the data on natural and created values at the location and project characteristics, a general assessment of the possible impacts has been made, the results of which are shown in Table 6.1.

1 - intensity;
2 - probability;
3 – reversible;
4 – lasting;
5 - spatial conditions (extent of influence);
6 - cumulative, synergistic;
7 – posibility of prevention, reduction or compensation

Evaluation of impact significance: + YES; − NO; ? unclear

Table 6.1. Matrix for checking the significance of the influence of the park of wind farms at the location of Kostolac on the environment

Project characteristics	**Impact characteristrics**							**Explanation**
Aspects of environmental protection of the project and the possibility of impact of the project on:	**Possibility of significant influence?**							**Include/exclude in the environmental assessment (YES or NO)**
	1	**2**	**3**	**4**	**5**	**6**	**7**	
1. AIR								
1.1Emision	**?**	+	**?**	-	-	-	-	**YES.** Possible impacts during construction as a result of machine operation.
2. WATER								
2.1 Surface water quality	-	-	-	-	-	-	-	**NO.** no influence.
2.2 Groundwater quality	-	-	-	-	-	-	-	
2.3 Hydrology	-	-	-	-	-	-	-	
2.4 Hydrogeology	-	-	-	-	-	-	-	
3. SOIL								
3.1 Agricultural land	-	-	-	-	-	-	-	**YES.** Possible influence on the landscape because the wind turbines will dominate the space.
3.2 Forest land	-	-	-	-	-	-	-	
3.3 Landscape / Relief	-	+	-	-	-	-	-	
3.4 Erosion / soil degradation	-	-	-	-	-	-	-	
3.5 Land fragmentation	-	-	-	-	-	-	-	
4. CLIMATE								
4.1 Emission of greenhouse gases	-	-	-	-	-	-	-	**NO.** no influence.
5. FLORA AND FAUNA								
5.1. Influence on ornithofauna	-	+	-	-	-	+	+	**YES.** Possible impacts.

Project characteristics	Impact characteristrics							Explanation
Aspects of environmental protection of the project and the possibility of impact of the project on:	**Possibility of significant influence?**							**Include/exclude in the environmental assessment (YES or NO)**
	1	**2**	**3**	**4**	**5**	**6**	**7**	
5.2. Impact on hiropterofauna	-	+	-	-	-	+	+	
6. POPULATION I HEALTH								
6.1Settlement structures	-	-	-	-	-	-	-	**NO.** no influence.
6.2. Human health	-	-	-	-	-	-	-	
7. OTHER ASPECTS								
7.1. Waste management system	-	-	-	-	-	-	-	**NO.** no influence.
7.2. Traffic load	-	-	-	-	-	-	-	
7.3. Noise level	-	+	-	-	-	-	-	**YES. Possible influences at source.**
7.4. Shadows flickering	-	+	-	-	-	-	-	
7.5. Heat load	-	-	-	-	-	-	-	**NO.** no influence.
7.7. Non-ionizing radiation	-	-	-	-	-	-	-	
7.8. Archaeological remains	-	+	-	-	-	-	+	**YES.** Theoretical potential impacts while pillars foundation and underground installation

Summarizing the characteristic of possible impacts of the planned project, the following can be noted:

а) the extent of the impact is limited in relation to intensity and spatial extent, and in the context of the current state of the environment. In the immediate vicinity of the building there are no vulnerable objects that can be exposed to the impact.

б) nature of cross-border impact: conditionally possible cross-border impact since the impact on internationally protected species of flying fauna can be considered as cross-border.

в) size and complexity of impact: the size and complexity of potential impacts (positive and negative), and given the nature of the project, is not expressed.

г) probability of impact: probability of impact can only be regarded in relation to ornithofauna and hiropterofauna. These effects are minimized by the optimal arrangement of wind turbines.

д) cumulative and synergetic effects can be expected as a result of the interaction of planned wind turbines within the wind farm itself.

In relation to the mentioned possible impacts of the planned project on the environment, a detailed impact assessment is based on them and analized through Chapter 6.2. of the Study.

Regarding the selection of the type of wind turbine to be installed, it is estimated that basically there are no significant differences between several types of this equipment in terms of environmental impact. Certain differences are related to the level of efficiency and the degree of utilization of wind potential in different operating modes, but for each of the types there is a very high level of reliability in the context of possible negative environmental impacts.

6.2. Quantitative-qualitative multicriterial assessment of the environmental impact

In order to analyze the possible impacts of certain activities and procedures during the construction and exploitation of the park of wind farms at the Kostolac site on environmental elements, from a broader list of potential impact factors (threats) that can be expected for this kind of intervention in nature, 10 possible factors are identified, which are actually individual activities on the realization of the project. Although for each of this item, it is possible to partially determine the summative, ie the average assessment of the effect (impact factor), we consider that their presentation as a whole, without partial analysis, is sufficiently purposeful and functional. For some factors, it can be said that they carry the same or similar information, so it seems justified to reduce their number. The fact is that some of them act synergistically, mutually reinforcing their actions, and therefore that matching information must be kept in the analysis. The synthetic display of the endangering factor is given over the mean values, not through the summative score that would then be scaled.

Impact factors were evaluated separately for each environmental component relevant to the scope of this study with estimates from 0 to 5 for the impact size, according to the following scale:

0 – no noticeable effect;
1 – low effect;
2 – tolerable effect ;
3 – medium high effect;
4 – high effect;
5 – very high effect (devastation).

For the importance of the impact of the scale from L to M, according to the following scale:

L – impact limited to location;
O – impact of importance for the municipality;
R – impact of a regional character;
N – influence of national character;
M – impact of cross-border character.

For probability of impact from M to I, according to the following scale:

M – possible impact (probability less than 50%);
V – probable impact (probability over 50%);
I – certain impact (probability 100%).

For the duration of the influence from P (occasional/temporary) to D (long term/permanent).

Also, the physical, biological and socio-cultural characteristics of the environment at the site are separated, and within them, a total of 16 components of the environment are defined.

The effect of the factor is assessed for the components of the environment at the site (!), and the results of the analysis are shown in the tables: 6.2 - 6.6, for all components of the environment and impact factors in the form of Leopold's matrix, and accordingly commented on in item 6.2.1.

Table 6.2. Matrix of the size of the factor influence on the components of the environment of the park of the wind farm at the location of Kostolac

		ACTIVITIES ON THE PROJECT											
	Predicted impact factors	Placing of the wind turbines	Foundation of the pillars	Use of construction materials	Construction of substation	Placing of the cables	Construction of internal traffic surfaces	Work of construction machines	Treatment of the waste materials	Realization of a temporary delivery point	Exploitation of the project	The sum of the IF values by type and bio. comp.	Average values
PHYSICAL COMPONENTS	Water	0	0	0	0	0	0	0	1	2	0	3	0.30
	Microclimate	0	0	0	0	0	0	0	0	0	0	0	0.00
	Soil	1	2	1	2	1	1	1	1	1	0	11	1.10
	Erosion	0	0	0	0	0	0	0	0	1	0	1	0.10
	Air	1	1	0	1	1	2	3	1	1	0	11	1.10
	Noise	2	2	0	2	1	2	3	0	1	3	16	1.60
BIOLOGICAL COMPONENTS	Florist diversity	2	2	0	2	1	1	1	1	1	0	11	1.10
	Faunistic diversity	1	1	1	1	1	0	1	1	1	2	10	1.10
	Ornithofauna	2	1	1	1	1	0	2	2	2	2	14	1.40
	Hiropterofauna	2	1	1	1	1	0	2	2	2	2	14	1.40
	Barriers/corridors	2	1	1	1	1	0	1	1	1	2	11	1.10
SOCIO-CULTURAL COMPONENTS	Landscape	3	1	1	2	1	1	1	2	2	3	17	1.70
	Land use	2	2	2	2	1	2	1	2	2	1	17	1.70
	Economy	0	0	0	0	0	0	0	0	0	1	0	0.10
	Cultural property	0	1	0	1	1	0	0	0	0	0	3	0.30
	Accidents	2	0	0	2	0	0	2	2	3	3	14	1.40
	Summary of IF values by environmental components	20	15	8	18	11	9	18	16	20	19		
	Average	1.250	0.937	0.375	1.125	0.565	0.562	0.375	1.000	1.250	1.187	**ИФ = 0.862**	

Table 6.3. Matrix of significance of the factor influence on the components of the environment of the park of the wind farm at the site Kostolac

		ACTIVITIES ON THE PROJECT									
	Predicted impact factors	Placing of the wind turbines	Foundation of the pillars	Use of construction materials	Construction of substation	Placing of the cables	Construction of internal traffic surfaces	Work of construction machines	Treatment of the waste materials	Realization of a temporary delivery point	Exploitation of the project
PHYSICAL COMPONENTS	Water	/	/	/	/	/	/	/	L	R	/
	Microclimate	/	/	/	/	/	/	/	/	/	/
	Soil	L	L	L	L	L	L	L	L	L	/
	Erosion	/	/	/	/	/	/	/	/	L	/
	Air	L	L	/	L	L	L	L	L	L	/
	Noise	L	L	/	L	L	L	L	/	L	L
BIOLOGICAL COMPONENTS	Florist diversity	L	L	/	L	L	L	L	L	L	/
	Faunistic diversity	L	L	L	L	L	/	L	L	L	M
	Ornithofauna	L	L	L	L	L	/	L	L	L	M
	Hiropterofauna	L	L	L	L	L	/	L	L	L	M
	Barriers/corridors	L	L	L	L	L	/	L	L	L	L
SOCIO-CULTURAL COMPONENTS	Landscape	O	L	L	L	L	L	L	L	L	O
	Land use	L	L	L	L	L	L	L	L	L	L
	Economy	/	/	/	/	/	/	/	/	/	O
	Cultural property	/	N	/	N	N	/	/	/	/	/
	Accidents	L	/	/	L	/	/	L	L	L	L

Table 6.4. Matrix of the probability of factor impact on the components of the environment of the park of the wind farm at the location of Kostolac

		ACTIVITIES ON THE PROJECT									
	Predicted impact factors	Placing of the wind turbines	Foundation of the pillars	Use of construction materials	Construction of substation	Placing of the cables	Construction of internal traffic surfaces	Work of construction machines	Treatment of the waste materials	Realization of a temporary delivery point	Exploitation of the project
PHYSICAL COMPONENTS	Water	/	/	/	/	/	/	/	M	M	/
	Microclimate	/	/	/	/	/	/	/	/	/	/
	Soil	V	I	M	I	I	I	V	M	M	/
	Erosion	/	/	/	/	/	/	/	/	M	/
	Air	V	V	/	V	M	V	I	M	И	/
	Noise	I	I	/	I	M	I	I	/	M	I
BIOLOGICAL COMPONENTS	Florist diversity	M	I	/	M	M	M	M	M	M	/
	Faunistic diversity	M	M	M	M	M	/	M	M	M	M
	Ornithofauna	M	M	M	M	M	/	M	M	M	I
	Hiropterofauna	M	M	M	M	M	/	M	M	M	I
	Barriers/corridors	M	M	M	M	M	/	M	M	M	M
SOCIO-CULTURAL COMPONENTS	Landscape	I	M	M	I	M	M	M	M	M	I
	Land use	M	M	M	I	M	I	M	M	I	I
	Economy	/	/	/	/	/	/	/	/	/	M
	Cultural property	/	M	/	M	M	/	/	/	/	/
	Accidents	M	/	/	M	/	/	M	M	M	M

Table 6.5. Matrix of the duration of influence of factors on the components of the environment of the park of the wind farm at the location Kostolac

		ACTIVITIES ON THE PROJECT									
	Predicted impact factors	Placing of the wind turbines	Foundation of the pillars	Use of construction materials	Construction of substation	Placing of the cables	Construction of internal traffic surfaces	Work of construction machines	Treatment of the waste materials	Realization of a temporary delivery point	Exploitation of the project
PHYSICAL COMPONENTS	Water	/	/	/	/	/	/	/	P	P	/
	Microclimate	/	/	/	/	/	/	/	/	/	/
	Soil	P	D	P	D	P	P	P	P	P	/
	Erosion	/	/	/	/	/	/	/	/	P	/
	Air	P	P	/	P	P	P	P	P	P	/
	Noise		P	/	P	P	P	P	/	P	D
BIOLOGICAL COMPONENTS	Florist diversity	P	P	/	P	P	P	P	P	P	/
	Faunistic diversity	P	P	P	P	P	/	P	P	P	D
	Ornithofauna	P	P	P	P	P	/	P	P	P	P
	Hiropterofauna	P	P	P	P	P	/	P	P	P	P
	Barriers/corridors	P	P	P	P	P	/	P	P	P	D
SOCIO-CULTURAL COMPONENTS	Landscape	D	P	P	D	P	D	P	P	P	D
	Land use	D	D	P	D	P	P	P	P	P	D
	Economy	/	/	/	/	/	/	/	/	/	D
	Cultural property	/	P	/	P	P	/	/	/	/	/
	Accidents	P	/	/	P	/	/	P	P	P	P

Table 6.6. Matrix of summary influences of factors on the components of the environment of the park of the wind farm at the location Kostolac

		ACTIVITIES ON THE PROJECT									
	Predicted impact factors	Placing of the wind turbines	Foundation of the pillars	Use of construction materials	Construction of substation	Placing of the cables	Construction of internal traffic surfaces	Work of construction machines	Treatment of the waste materials	Realization of a temporary delivery point	Exploitation of the project
PHYSICAL COMPONENTS	Water	/	/	/	/	/	/	/	1/L/M/P	2/P/M/П	/
	Microclimate	/	/	/	/	/	/	/	/	/	/
	Soil	1/L/V/P	2/L/I/D	1/L/M/P	2/L/M/D	1/L/I/P	1/L/I/P	1/L/V/P	1/L/M/P	1/L/M/P	/
	Erosion	/	/	/	/	/	/	/	/	1/L/M/P	/
	Air	1/L/V/P	1/L/V/P	/	1/L/V/P	1/L/M/P	2/L/V/P	3/L/I/P	1/L/M/P	1/L/M/P	/
	Noise	2/L/I/P	2/L/I/P	/	2/L/I/P	1/L/M/P	2/L/I/P	3/L/I/P	/	1/L/M/P	3/L/I/D
BIOLOGICAL COMPONENTS	Florist diversity	2/L/M/P	2/L/I/P	/	2/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	/
	Faunistic diversity	1/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	/	1/L/M/P	1/L/M/P	1/L/M/P	2/M/M/D
	Ornithofauna	2/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	/	2/L/M/P	2/L/M/P	2/L/M/P	2/M/I/P
	Hiropterofauna	2/L/M/P	1L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	/	2/L/M/P	2/L/M/P	2/L/M/P	2/M/I/P
	Barriers/corridors	2/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	1/L/M/P	/	1/L/M/P	1/L/M/P	1/L/M/P	2/L/M/D
SOCIO-CULTURAL COMPONENTS	Landscape	3/O/I/D	1/L/M/P	1/L/M/P	2/L/I/D	1/L/M/P	1/L/M/D	1/L/M/P	2/L/M/P	2/L/M/P	3/O/I/D
	Land use	2/L/M/P	2/L/M/D	2/L/M/P	2/L/I/D	1/L/M/P	2/L/I/P	1/L/M/P	2/L/M/P	2/L/M/P	1/L/I/D
	Economy	/	/	/	/	/	/	/	/	/	1/O/M/D
	Cultural property	/	1/N/M/P	/	1/N/M/P	1/N/M/P	/	/	/	/	/
	Accidents	2/L/M/P	/	/	2/L/M/P	/	/	2/L/M/P	2/L/M/P	2/L/M/P	3/L/M/P

6.2.1. Estimated effect of impact factors on individual components of the environment

6.2.1.1. Physical components

On the water regime and quality, the project will not have a significant impact. When using a wind farm, water is not used, so waste water is not generated. However, it is possible to pollute the waters during the implementation of the Temporary Delivery Point (TDP), which is why special attention should be paid during the realization of the TDP itself, as well as during the transshipment of the equipment. There is no impact of the project on the change of microclimatic characteristics and parameters and the stimulation of erosive processes.

When it comes to the possible impact on the soil, they are predominantly possible as a result of the foundation of the wind turbine pillars, as a result of the construction of a substation, the manipulation of construction machinery on site, and inadequate treatment of waste materials during the construction of the wind farm. The total average value of the magnitudes of the expected impacts is within the frames of a low effect (1.10), dominantly of local character, with a constant or occasional effect.

At the TDP, local erosive processes may occur if the trees and shrubs are eradicated, and this option should be avoided.

By applying one of the basic principles of the concept of sustainable development, which is the use of renewable energy sources, it is encouraging to reduce the use of fossil fuels and reduce air pollution. In addition, the use of fossil fuels for the production of electricity from several aspects affects environmental pollution, while the use of wind energy in electricity production produces multiple positive effects on the environmental quality. Each kilowatt of electricity produced from renewable sources represents a kilowatt of electricity less from non-renewable sources. This positive impact is noticeable in the wider context, which in a positive sense goes beyond the scope of the project. However, certain negative effects are possible during the construction phase of the wind farm and as a result of the realization of certain segments of the project, primarily the realization of traffic surfaces for the needs of the functioning of the complex of the wind farm and the substation complex. These effects are reflected in the air pollution caused by the manipulation of vehicles and machinery and in the form of raising dust. The overall average value of the magnitude of the expected impacts of the project on air quality is in the low-level (1.10), local character.

In modern wind generators, using the so-called "optispeed" generator has achieved the constant wind angular velocity (typically 16 rpm) in a wide range of wind speeds, and one consequence is a significant reduction in noise and vibration levels. In addition to the power and dimensions of the wind turbine, an especially important aspect of understanding the noise intensity is the spatial aspect. The noise generated by the wind generator decreases with increasing distance from the wind turbine. In order to model the noise intensity, the Rulebook on the methodology for the determination of acoustic zones ("Official Gazette of the RS" No. 72/10) was first interpreted. In this respect, the permissible levels of noise in certain areas of the settlement are prescribed. Values range from 50 dBA per day to 40 dBA per night in the holiday and recreation zone, hospitals and parks, all the way to 70.2 dBA (both day and night) in purely industrial parts of the city. When measuring the exposure of the objects (buildings, houses, etc.) in the open space, the noise level is measured at 1-2 meters in front of the facade,

or 0.5 meters in front of the open window. According to the opinion of the expert team that was involved in the preparation of the subject impact assessment study of the Kostolac wind farm project and consultations with relevant institutions and experts, the complex of the planned wind farm should be treated as zone VI - industrial zone, while the closest residential buildings should be treated as zone II - small and rural settlements. This statement was taken into account when assessing the noise intensity and its spatial dispersion in the field of project realization. A noise intensity model of the planned wind farm was modeled using the Danish "noise intensity calculator for wind turbines" (Figure 6.1).

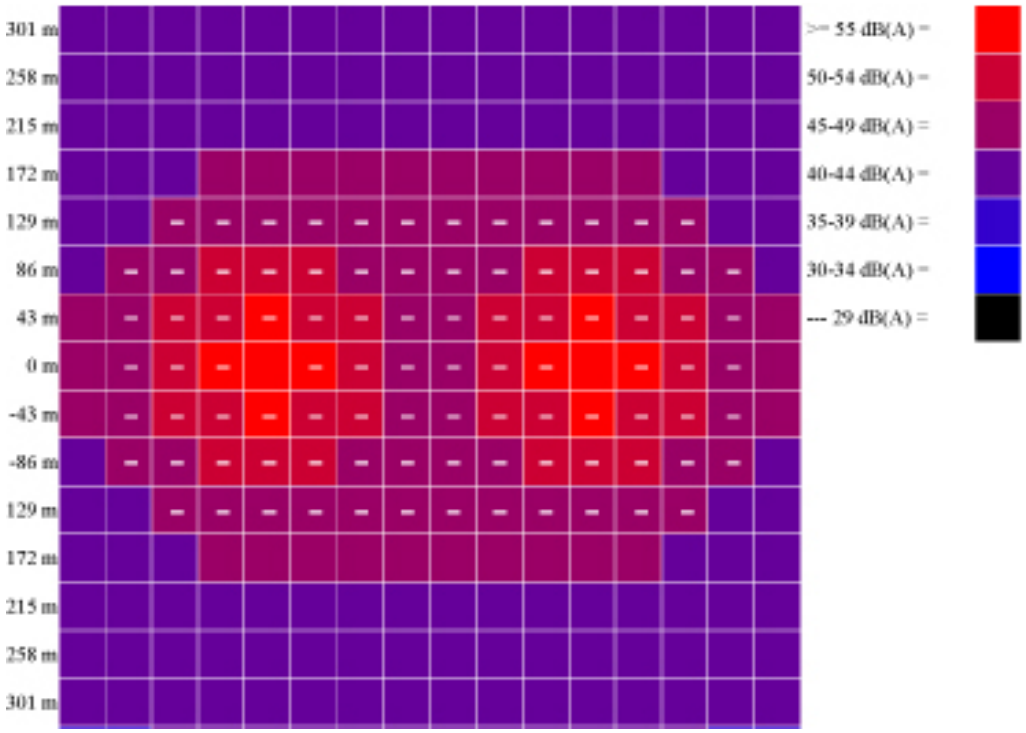


Figure 6.1. *Expected spatial dispersion of noise as a result of the operation of the wind farm*

Considering the fact that during the disposition of the wind turbine pillars, the aspect of possible noise impacts from the wind turbines was taken into account, as shown in Figure 6.1. it was found that the levels of noise from the wind turbines are significantly below the legally prescribed levels and that in this context there will be no noise increase except at the source, in the vicinity of wind turbines. In this context, the spatial disposition of the wind turbines is very favorable and there are no significant negative impacts in terms of exposure to people to increased noise intensity, since the nearest residential buildings are located at a distance of about 500 meters from the planned Kostolac wind farm, while the assessment is that the noise intensity will be reduced to within the frames of the legislation, already 300 meters away from the wind turbines. Less negative impacts on noise increase can be expected during the construction of a wind farm, primarily as a result of manipulation of construction machinery and transportation of equipment from TDP to the very location on which wind turbines will be installed. Such influences are of local character and can only occur temporarily and occasionally during the construction itself. The overall average value of the magnitude of the expected impacts of the project on the noise intensity is in the low-performance frames (1.60).

6.2.1.2. Biological components

On the basis of conducted one-year monitoring of ornithofauna in hiropterofauna on the wider area of the planned wind farm Kostolac, fewer possible negative impacts were identified, which were minimized by preventive measures by correction of the original disposition of the wind turbine pillars resulting from the results of annual observations. On the basis of the analyzed data on the presence, directions, altitudes and flying directions of members of different bird species, as well as on the basis of the layout of wind turbines, no strong intensity was assessed at the given location for none of the influence.

Based on the foreseen layout of the wind turbines at the future Kostolac wind farm and based on the data at the observation points, it can be assumed that there should not be no significant negative impact of the construction and operation of the wind farm on the bird fauna. The wind turbines at the future wind power plant Kostolac, which according to the project are 20, according to the plan provided by the investor at the beginning of this monitoring, were located on four sub-locations in the area of the subject location. Based on the analyzed data on the presence, directions, altitudes and directions of flying members of different bird species, as well as on the basis of the layout of wind turbines, it can be assumed that the greatest impact of the construction and operation of the future wind farm Kostolac will be on the members of the largest and most frequently present species. However, due to the registered characteristics of their overflights, and most often andf other target species that were flying at critical altitudes were very few, and with considerable certainty it can be estimated that the influence of wind turbines on them will be minor. On the other hand, the original arrangement of positions of wind turbines was relatively acceptable from the point of view of the influence of bird fauna, except for the wind turbines that were predicted at the westernmost part of the investigated area, around the established OP 2. In synergy with preliminary findings and recommendations for the monitoring of bats, wind generators at the location of Petka were therefore relocated. After the suggestions to the investor, in the initial phases of the works, came the current arrangement of the turbines, which is a compromise and satisfactory solution. The new situation in the area of the potential wind farm, besides meeting the requirements of preservation and protection of bird fauna, meets the criteria for protection and conservation of the fauna of the bats. Unlike bats, birds in the subject area do not have pronounced and strict flying corridors, but with minor correction in the placement of the wind turbines investor made that their new positions have a smaller effect on the area where there is a greater presence of target species, which can only increase the chances of safe passage of migratory and diurnal flying birds (and bats). No significant intensity was assessed at the subject site for no influence. Of the target species, cumulatively the greatest effect would be the storks and herons, buzzards, kestrels, and the swans, and among the other selected species of Bee-eaters, Eurasian skylark and starlings. It is important to say that the number of members of most of these species is relatively small, and that therefore there should be no significant effect on them.

On the other hand, it is necessary to emphasize the possible positive influence of the construction and operation of the wind farm and the accompanying infrastructure on certain types of birds. Maintaining the space around the base of the pillars of wind turbines in the form of grass mowing can contribute to the increase in the number of nesting breeds of species affected by high grass, as blossoms *Anthus spp., Motacilla sp*. and *Alaudidae.* The total average value of the magnitude of the expected impacts of the project on the ornithofauna is in the low-performance frames (1.40).

Observed as a whole, wind farms have a certain, though not high, significance for conserving the local fauna of the bats. This exclusively refers to local populations of the species

Pipistrellus kuhlii, Pipistrellus nathusii, Nyctalus noctula (not for the migratory populations of *Pipistrellus nathusii* и *Nyctalus noctula*), for which at least some of the moderately important ecological functions exist at the sites themselves, atleast occasionally and/or locally here records their high or moderate activity and relative numbers, which may be expected in the near future for *Hypsugo savii.* Based on the preliminary analysis of the conflicts, the investor was suggested, and the investor accepted that certain wind turbines should be repositioned outside the observed zones of increased risk of death, and according to the current plan, all positions of the wind generators are located at a safe distance from the most important identified corridors, so that it is believed that from the aspect of preventing/reducing the suffering of bats, maximum has been achieved by planning the layout of wind generators. Based on the overall preliminary analysis, which has been elaborated and explained in detail, it is estimated that most of the measures necessary for preventing the harmful effects of the wind farm have already been implemented by preventive planning of the positions of wind generators in the function of protecting bats and birds, and all defined positions of wind generators are suitable for construction and work with the implementation of general protection measures. The overall average value of the magnitudes of the expected impacts of the project on the hiropterofauna is in the low-performance frames (1.40). The overall average value of the magnitudes of the expected impact of the project in question on the creation of the barriers/corridors lies in the low-performance framework (1.10).

Assessment of the effect on ornithofauna and hiropterofauna was made in relation to the following indicators:

- number and species of potentially affected birds during one year and
- number and species of potentially affected bats during one year

taking into account the behavior of flying fauna in the periods of silence and the periods of optimal air flows for the operation of the wind farm and on the altitudes and flight mode of the target species covered by monitoring.

Ecological aspects of TDP are primarily seen in the adverse impact that it can produce on the present ecosystems. Depending on the selected TDP solution, the following impacts can be expected: the impact on the flora - the removal of existing coastal and other plants to ensure the smooth operation of the transshipment (primarily when it comes to using the crane, and its horizontal radius of equipment transshipment, where high plants can interfere with safe and proper functioning); impact on the fauna - due to mechanization, there will be noise, which may have an adverse effect on the presence of special species, but with the temporary nature of the chosen solution, in accordance with the Opinion of the Institute for Nature Protection (attached), it is preventing that temporary distraught fauna in time, will return to the locality that was disturbed by the transshipment and the noise that resulted from it; impact on flora and fauna - primarily concerns the possible release of toxic substances that can occur as a result of mechanization work that can be prevented by applying organizational and technical measures of protection.

6.2.1.3. Socio - Cultural Components

The total average impact factor for these components falls into the category of low effect (1.04). The reason for this is the specificity of the purpose of which the location of the planned wind farm was used, and for which purpose the surrounding area is used today,

which in the previous period led to partial or complete anthropogenic changes in the area, with all its social implications. The most significant average value of the impact factor is in relation to the overall appearance of the landscape.

Landscape characteristics represent a subjective category that is not easy to quantify. The visual impact on the environment is a subjective impression that, apart from the perception of the observer, depends on the type of landscape and the specific visual characteristics. Analyzing the target location of the planned purpose, it was concluded that the wind turbines will dominate the environment, so that it can be concluded that the existing area will significantly change by the construction of the planned wind farm. With careful planning, shaping and coloring of wind turbines, this impact can be partially reduced. The opinion of the expert team is that the planned disposition of wind turbines, although primarily based on the performed production estimation and preventive protection of flying fauna and population (noise), will not disturb the landscape features of the space, but will give it a special visual identity. On the other hand, on the wider area of the planned Kostolac wind farm, there are energy facilities/thermal power plants whose chimneys already influence the change of the landscape, which, in summary, diminishes the significance of the potential impacts of the planned wind farm on the landscape and the ambient values of the wider area. In addition, the installation of a wind turbine can have an impact on the shading and glare of the wind turbine or the so-called shadows flickering. Wind turbines are large and high objects and as such they can shine the light, or they can create a shadow in the environment. When the unit is in operation, an unpleasant flickering of the shadow can be detected at distances up to 10 diameters of the rotor. Given the configuration of the terrain, the disposition of wind turbines and existing objects in the surrounding area of the subject area, as well as the course of the Sun's movement, it can be concluded that such effects will not be expressed in a way that would present an obstacle. The total average value of the magnitudes of the expected impacts of the project on the landscape is in the low-performance frames (1.70).

Wind farms physically occupy only a few percent of the area (the surface area for the foundation of the objects) on which they are stretched, while the rest of the surface between the stand of the turbine and around the internal roads can be used for other purposes, that is, it can be used without restriction for the original purpose. In this case, it can still be used for agricultural production, and in the context of changing the purpose of land use there is no significant impact. The total average value of the magnitude of the expected impacts of the project in question on the purpose of using the land is in the low-performance framework (1.70).

In economic terms, there is a possibility of local government agreeing with the investor/contractor to pay for the compensation/fee for the implementation of a project on its territory, whereby local government can achieve some (but not large) profits. This can be achieved by paying a certain percentage of the profit to the local government budget. The total average value of the magnitude of the expected impact of the project on the local government economy is within the very low effect (0.10).

Although at the location of the planned Kostolac wind farm there are no recorded archaeological sites, although the land on this site has already been substantially in the past exposed to significant mining activities, theoretically it is possible to encounter undiscovered archaeological remains during digging and foundation of objects. In such situation it is necessary to take adequate measures in order to preserve such remainings, ie to stop the works and to inform the Institute for the Protection of Cultural Monuments. The total average value

of the magnitudes of the expected impacts of the project on cultural goods is reduced to the limits of the theoretically possible (0.30).

There is a possibility of accidents arising from the work of a wind power plant. However, equipment manufacturers predict inevitably all necessary measures to protect against accidents, and these are the following potential accidents:

- fire hazard,
- lightning strike hazard;
- ice-gathering on wind turbines blades hazard,
- wind turbines blades breaking of during severe winds.

The risk of an accident on a wind turbine is very small. Experiences from the world show that no wind turbine accidents have been reported anywhere that would cause significant ecological consequences. At the given location, there is no direct danger for residential or industrial buildings, even in the case of the most serious hazard (torn blades or other parts during the work or demolition of the entire pillar with a wind turbine). There is a danger of pillars which are positioned near existing local roads, where it is necessary to strictly apply the proposition of manufacturers of equipment related to minimizing the possibility of accidents during periods of extreme weather conditions (strong winds and ice formation on blades due to low temperatures). In order to avoid the occurrence of possible accidents, it is necessary to define adequate measures for protection and reduction of the risk of accidents and within the impact assessment, which should ensure the implementation and control of technical specifications that are prescribed by equipment manufacturers in the context of protection against accidents. The overall average value of the magnitudes of the expected impacts of the project on the possibility of implicating accidental situations is within the low-performance frames (1.40) and are of local character.

6.3. Collective effect of impact factors on environmental components

From Table 6.6. as the factors with the greatest colective impact on the components of the environment, stand out the activities in the phase of construction of a wind farm (work of construction machines, installation of wind turbines and their foundation, construction of substations and construction of TDP) and potential impacts during the exploitation of the project with possible influence to ornithofauna, hiropterofauna and increase of the noise intensity at the source.
The greatest sensitivity is shown in biological components, primarily due to possible effects on the flying fauna, but these impact values are low. Impacts are actually expressed with low intensity only on a limited space and are mostly limited in time. The average assessment of the effects of the impact factors collectively on the components of the environment is 1.22. This factor impact factor is a **low-performance frame**.

The effect of the impact factor will have a limited effect on the entire space of the site in question. Construction machinery and transport vehicles will be engaged in the construction phase. It is expected that during the operation of these machines, there will be emissions of gases in the air, as well as increased noise levels. Negative environmental effects can not be effectively prevented in this case, and preventive measures relate primarily to the regular maintenance of machines, greater efficiency of exploitation of their work and proper treatment of waste materials that may arise during the construction stage of the wind farm.

Nevertheless, if the negative effect of these and other factors is considered as a whole, it should be emphasized that qualitative and quantitative losses in the living world will nevertheless be negligible both spatially and timelly very limited, practically at the very location. Negative effects will not significantly affect the surrounding area, while some of their effects will only be revealed during the construction of objects. The survival of none species nor significant, sensitive or rare ecosystems and other natural values will be questioned, or will have no significant consequences for the living world and the basic environmental factors.

At the stage of exploitation of the facility, and with the correct and consistently implemented recommended and prescribed protection measures, significant physical and biotic components of the environment are not expected to be significantly endangered.

6.3.1. Summary of the possible impacts

Quality of air, water, soil, noise and vibration, heat and radiation - Using renewable energy sources positively affects air quality. This positive impact is noticeable in a wider context and beyond the scope of the project. However, certain negative effects are possible during the construction phase of the wind farm and as a result of the realization of certain segments of the project, primarily the realization of traffic surfaces for the needs of the functioning of the complex of the wind farm and the substation complex. These effects are reflected in the air pollution caused by the manipulation of vehicles and machinery and in the form of raising dust. On the regime and quality of surface waters, the given project can have an impact during the realization and functioning of the TDP. When using a wind farm, water is not used, so waste water is not generated. Certain negative impacts can occur in the construction phase and in case of accidental situations and oil leakage into groundwater, but the likelihood is at the level of theoretical assumptions. When it comes to the possible impact on the soil, they are predominantly possible as a result of foundation of wind turbine pillars, manipulation of construction machinery on site, and inadequate treatment of waste materials during the construction of a wind farm. In relation to the noise and vibration generation, based on the spatial noise dispersion and the values obtained from noise modeling, noise levels from wind turbines were found to be significantly below the legally prescribed levels. In this context, the spatial disposition of wind turbines is very favorable and does not have significant negative impacts in terms of exposure to people with increased noise intensity and vibrations. The wind farm project does not produce thermal pollution, and in the context of radiation, there are electric and magnetic fields in the substation as a type of non-ionizing radiation. Since there are no residential facilities near the substation, such impacts are not considered significant because there is no exposure of the population to these influences.

Health of the population - Due to the specificity of the site in terms of the vicinity to the settlement and the nature of the technological process in the wind farm, there are no effects on the health of the population. During the construction of the wind farm, possible impacts related to possible injuries at work are possible. Theoretical possibilities for endangering the health and life of the population exist only in the event of accidents, in cases where, at the time of eventual accidents (eg tearing up/fracture of blades), the people find themselves at the site.

Meteorological parameters - There is no impact of the project on the change of microclimatic characteristics and parameters.

Ornithofauna and hiropterofauna - It can be assumed that the greatest impact of the construction and operation of the future Kostolac wind farm will be on the members of the most numerous and most frequently present species. However, due to the registered characteristics of their overflights, most often and other target species that were flying at critical altitudes were very few, and with considerable certainty it can be estimated that the influence of wind turbines on them will be minor. Of the target species, cumulatively the greatest effect would be the storks and herons, buzzards, kestrels, and the swans, and among the other selected species of Bee-eaters, Eurasian skylark and starlings. It is important to say that the number of members of most of these species is relatively small, and that therefore there should be no significant effect on them. On the other hand, it is necessary to emphasize the possible positive influence of the construction and operation of the wind farm and the accompanying infrastructure on certain types of birds. Thus, the construction of a transmission line in terms of compulsory complementary infrastructure can have a significant effect on the nesting populations of those bird species that favor transmition lines for nesting. As it has already been established, many species are gladly nesting on the transmission lines, such as *Passer* spp., *Sturnus vulgaris, Corvus corax*, *Corvus cornix*, *Pica pica*. The ravens nests are usually used by predators such as *Falco tinnunculus*, *Buteo buteo*, *Falco subbuteo*, *Falco cherrug*, and very rarely by *Aquila heliaca*. Maintaining the space around the base of the pillars of wind turbines in the form of grass mowing can contribute to the increase in the number of nesting breeds of species affected by high grass, such as *Anthus* spp., *Motacilla* sp. and *Alaudidae*. As far as the bats are concerned, wind farms have a certain, though not high, significance for conserving the local fauna of the bats. This exclusively refers to local populations of the species *Pipistrellus kuhlii, Pipistrellus nathusii, Nyctalus noctula* (not for the migratory populations of *Pipistrellus nathusii* и *Nyctalus noctula*), for which at least some of the moderately important ecological functions exist at the sites themselves, atleast occasionally and/or locally here records their high or moderate activity and relative numbers, which may be expected in the near future for *Hypsugo savii.* Based on the preliminary analysis of the conflicts, the investor was suggested, and the investor accepted that certain wind turbines should be repositioned outside the observed zones of increased risk of death, and according to the current plan, all positions of the wind generators are located at a safe distance from the most important identified corridors, so that it is believed that from the aspect of preventing/reducing the suffering of bats, maximum has been achieved by planning the layout of wind generators. Based on the overall preliminary analysis, which has been elaborated and explained in detail, it is estimated that most of the measures necessary for preventing the harmful effects of the wind farm have already been implemented by preventive planning of the positions of wind generators in the function of protecting bats and birds, and all defined positions of wind generators are suitable for construction and work with the implementation of general protection measures.

Population, concentration and migration of the population - There is no impact of the project of the subject wind farm on the population, concentration and migration of the population.

Purpose and use of surfaces – Wind farms physically occupy only a few percent of the area (the surface area for the foundation of the objects) on which they are stretched, while the rest of the surface between the stand of the turbine and around the internal roads can be used for other purposes, that is, it can be used without restriction for the original purpose. In this case,

it can still be used for agricultural production, and in the context of changing the purpose of land use there is no significant impact.

Utility infrastructure - The project will have no impact on the existing communal infrastructure, and the planned internal communal infrastructure will be carried out in accordance with the valid regulations and conditions of the relevant institutions obtained in the regular procedure for the needs of the project.

Natural assets of special values and cultural heritage - The smallest distance of the wind farm from the SNR Deliblatska pescara (which is also an important bird area - IBA) is about 4 km (southwestern border), i.e. about 7 km (Deliblatska pescara itself). During construction work, heavy machinery and vehicles will not jeopardize the Deliblatska pescara. The distance of the project site from the protected area is large enough that there is no possibility of disturbance or loss of protected habitats in the named area during the construction of the wind farm. According to the data from higher level plans and plans of the surrounding areas, which are related to the subject area, there are no objects that have the character of the cultural heritage, except for the site of Rukumija - a bronze age archaeological site and a monastery, which is considered not to be under impact of the Project.

Landscape characteristics of the area - Analyzing the target location of the planned purpose, it was concluded that the wind turbines will dominate the environment, so it can be concluded that the existing landscape will significantly be changed by the construction of the planned wind farm. With careful planning, design and color of wind turbine columns, this impact can be partially reduced. The opinion of the expert team is that the planned disposition of the wind turbines will not disturb the landscape features of the space, but will give it a special visual identity. On the other hand, on the wider area of the planned Kostolac wind farm, there are energy facilities/thermal power plants whose chimneys already influence the change of land, which, in summary, diminishes the significance of the potential impacts of the planned wind farm on the landscape and the ambient values of the wider area. In addition, the installation of a wind turbine can have an impact on the shading and glare of the wind turbine or the so-called shadows flickering. Wind turbines are large and high objects and as such they can shine the light, or they can create a shadow in the environment. When the unit is in operation, an unpleasant flickering of the shadow can be detected at distances up to 10 diameters of the rotor. Given the configuration of the terrain, the disposition of wind turbines and existing objects in the surrounding area of the subject area, as well as the course of the Sun's movement, it can be concluded that such effects will not be expressed in a way that would present an obstacle.

6.4. Cross-border impacts

As a signatory to the ESPOO Convention (Law on the Confirmation of the Environmental Impact Assessment in a Transboundary Context, "Official Gazette of the RS - International Agreements", No. 102/2007) and the Kyoto Protocol (Law on the ratification of the Kyoto Protocol to the United Nations Framework Convention on Change (Official Gazette of the RS, No. 88/2007 and 38/2009), as well as international agreements related to the conservation of migratory species (Law on the Confirmation of the Convention on the Conservation of Migratory Species of Wild Animals, "Official Gazette of the RS - International Treaties ", No. 102/2007); The Republic of Serbia has undertaken to notify other countries of projects that may have a cross-border impact.

Under the terms of the ESPOO Convention on Impact Assessment, cross-border impact is defined as: "Any impact, not only of a global nature, within an area of jurisdiction on the one hand, caused by the activity of physical origin, in whole or in part, in an area under the jurisdiction of the other party".

An additional argument for the cross-border cooperation between the Kostolac wind farm project is contained in the Decision II/14 of the Republic of Serbia of February 2016 on the Amendments on Environmental Impact Assessment in the Transboundary Context (ESPOO), which in the point 22. defines the procedure for "large installations for the use of wind power for the purpose of producing electricity (the so-called "wind farms")".

Of all the dominant influences that the wind farm can imply in some area (impact on flying fauna, increasing noise intensity, visual impacts and shadows flickering) in the case of the Kostolac wind farm, and in the context of possible cross-border impacts on neighboring Romania whose border is at about 15 km northeast of the most eastern position of the wind turbine of the Kostolac wind farm, one can speak of:

1. Visual impact (visibility of the wind farm from the territory of Romania) and
2. Impact on a flying fauna with the status of internationally protected species.

When we speak about visual impact, item 6.2.1.3. of the Study elaborated visual impacts and it was concluded that the wind farm Kostolac will dominate the area that is in the immediate vicinity of the wind farm due to the height of the wind turbines. However, in a transboundary context, this impact is completely relativized with regard to the distance of the location from the nearest settlements in Romania (18km - Socol, 20km - Campia, 22km - Parneaura), especially in view of the topography of the terrain. Namely, between the location of the Kostolac wind farm and Romania, on the territory of the Republic of Serbia, there are locations: Lipar, Dos, Dolovi, Veliko Brdo, where altitudes range from 230m to 324m (Figure 6.2).

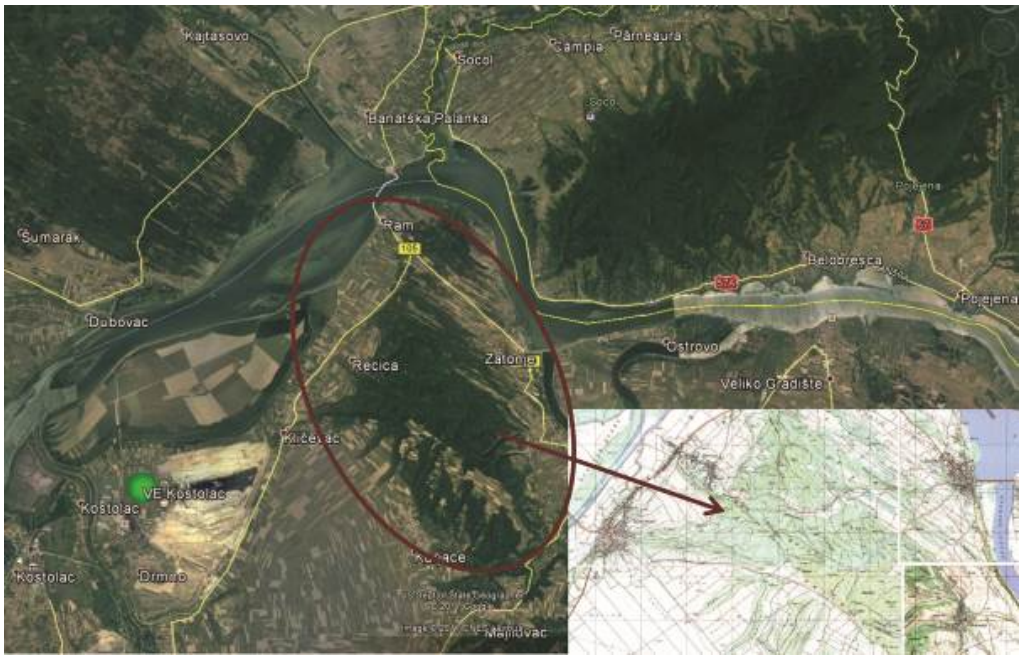


Figure 6.1. *Topography of the terrain on the space between wind farm Kostolac and Romania*

Bearing in mind the height of the 180-meter wind turbine with the vertical position of the blade, the topography at the site of the Kostolac wind farm (70 meters above sea level), as well as the altitudes of the locality: Lipar, Dos, Dolovi, Veliko Brdo, located on the area between the location of the wind farm and the territory of Romania and its closest settlements, it is evident that the visual impact is considered negligible because either it will not be noticeable or it will not exist at all (depending on the location of observation).

When the second possible cross-border impact is analyzed, the impact on the flying fauna, as mentioned earlier, at about 15 km northeast of the easternmost positions of the wind turbine of the Kostolac wind farm is the state border with Romania. Also, from this closest point on the state border along the Danube River in neighboring Romania, is the *Porcile de Fier* National Park. This very spacious (115,655 ha) protected area represents a unique natural entity with protected or predicted for protection areas in Serbia located in the vicinity of the wind farm's location - Labudovo okno, ie Donje Podunavlje, and further downstream with the National Park Đerdap. These protected areas, both in Serbia and Romania, have undoubted importance for the conservation of bird fauna, which has led to the release of several important and internationally important bird areas (IBAs) and internationally protected Ramsar areas in this area. And the entire Danube valley is a very important European migration corridor, both for birds and bats, which is why its stream with the coastal belt is protected by law as an ecological corridor of international importance and part of the ecological network of Serbia.

However, despite the close proximity of such important bird habitat (or perhaps because the ecological conditions for many bird species and bats in these protected zones are incomparably more favorable than in the zone of the wind farm's location), the monitoring of the activities of flying fauna (November 2014 - November 2015) found that the number/activity of migratory bird populations (members of the *Anseridae, Ardeidae, Falconidae, Accipitridae, Gruidae* and others) and the bats (*Pipistrellus nathusii and Nyctalus noctula*) were small/low in the zone of the Kostolac wind farm location, even negligible, so the risk of their suffering is estimated to be small or negligible. By applying the principles of preventive planning in the function of protecting bats and birds, this low risk is further reduced, since all implemented measures for the prevention and reduction of adverse impacts (undertaken by a slightly higher risk identified for some local population of sedentary species) have a positive impact and to migratory populations. In this context, possible transboundary impacts in relation to internationally protected species of ornithofauna and hiropterofauna are maximally minimized by the optimal spatial distribution of wind turbines, based on detailed observations of flying fauna.

Other possible cross-border impacts have not been identified even at the theoretical level.

7. ENVIRONMENTAL IMPACT ASSESSMENT IN CASE OF ACCIDENTS

There is a possibility of accidents arising from the work of a wind power plant. However, equipment manufacturers predict inevitably all necessary measures to protect against accidents, and these are the following potential accidents:

- fire hazard,
- lightning strike hazard;
- ice-gathering on wind turbines blades hazard,
- wind turbines blades breaking of during severe winds.

The risk of an accident on a wind turbine is very small. Experiences from the world show that no wind turbine accidents have been reported anywhere that would cause significant ecological consequences.

At the given location there is no direct danger to the objects, even in the case of the most serious hazard (torn blades or other parts during the work or demolition of the entire pillar with a wind turbine). However, special attention should be paid to the way that VG15, VG16 and VG 17 operate in the period of extreme climatic events (extreme wind blows and eventual icing on the blades) and in case of the realization of a new municipal public road that should pass near these positions.

It is of particular importance that the site and work organization are professionally done in order to minimize possible consequences at that stage. This implies the organization of continuous control in the procurement of construction materials and the execution of construction works. The investor is obliged to provide exclusively approved construction materials and equipment from an authorized supplier, and through professional supervision performs regular quality control of the materials that are being installed.

Particular attention must be paid to the transshipment (TDP), transport and temporary storage of building materials and equipment, so that at that stage of the works due to weather conditions or other circumstances, construction materials and equipment would not lose some of their properties and quality and not to jeopardize the quality of the basic environmental factors.

In the construction and exploitation phase of the building, the investor is obliged to take all the necessary fire protection measures and to process them in detail in the appropriate fire-fighting department. Also, all employees, both in the construction phase and in the stage of exploitation of the facility, must be adequately trained and equipped for timely and efficient reaction in such situations.

Regarding the possibility of a lightning strike in the wind turbine, it exists, but manufacturers in their technical specifications inevitably predict the placement of lightning rods on the tips of the wind turbines, thus eliminating this possibility. The manufacturer of the equipment in its specifications also defines the wind speeds in which the automatic shutdown of the system occurs which prevents the possibility of damage.
Dangerous substances could be used in the regular operation of the wind farm are (1) hydraulic oils and lubricants, anti-freeze and other chemicals for cleaning and maintenance of wind turbines (necessary for operation) and (2) transformer oil in the substation.

The use of hazardous substances necessary for the operation of wind turbines are defined by the regulations of the manufacturer which is, as a rule, certified according to the ISO 14001: 2004 standard.

The replacement of the oil contained in the lubrication devices and lubricating systems in the type of wind turbine projected by the project will be carried out periodically, as part of the regular preventive maintenance of the plant.

All listed possible accidents are extremely rare and for the prevention of possible impact measures are implemented during the design of the plant, exploitation of the facility, the monitoring of the condition of the equipment and the operational maintenance in accordance with the regulations and standards.

7.1. Earthquake risk exposure of the project

Since earthquakes, as a specific natural phenomenon, always carry as a basic feature of their destructive effect the spread in a spatial - regional continuum (and beyond any possibility of people to influence it), this review will refer to the seismicity of the territory where the location of the construction of the Kostolac wind farm and the wider environment to which it belongs.

For a detailed analysis of the local soil response to seismic activity, a detailed Seismic micro-regulation of the terrain at the scope of the Project has been done to define project seismic parameters in accordance with the positive regulations of Serbia and Eurocode 8-1. The analyzes were carried out with the aim of defining the parameters of the horizontal elastic spectrum of the local soil response, the corresponding time histories of acceleration and deformable soil properties compatible with the seismic effect on the four microlocation WF Kostolac: Drmno, Klenovnik, Ćirikovac and Petka.

For the location of the facilities of the wind farm in Kostolac – ***locality Drmno*** the categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

The liquefaction resistance of the local soil is defined using the results of geomechanical investigations, mainly CPT tests. CPT field tests in their essence, represent a continual representation of the change of soil properties along the depth of the geotechnical profile. Altogether 7 CPT tests were performed at Drmno site. By analyzing the data of all 7 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Drmno is low. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac-locality Drmno showed that there is no potential for the occurrence of liquefaction. The results of an independent analysis of laboratory and CPT tests are consistent with the existence of conditions for the initiation of liquefaction and, according to the probability of events and the index of the liquefaction potential, the danger is defined as "unlikely".

For the location of the facilities of the wind farm in Kostolac – ***locality Klenovnik*** the categorization has determined that the soil conforms to soft soil according to Serbian standard

and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

Altogether 6 CPT tests were performed at Klenovnik site. By analyzing the data of all 6 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Klenovnik is low. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac-locality Klenovnik showed that there is no potential for the occurrence of liquefaction. The results of an independent analysis of laboratory and CPT tests are consistent with the existence of conditions for the initiation of liquefaction and, according to the probability of events and the index of the liquefaction potential, the danger is defined as "unlikely".

For the location of the facilities of the wind farm in Kostolac – ***locality Ćirikovac*** the categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type C. The type of spectrum is I based on magnitude of the competent earthquake.

A total of 4 CPT tests were performed at the Ćirikovac site. By analyzing the data of all 4 CPT experiment in 3 cases of very low value of the index of the liquefaction potential were obtained and the high potential at the WG 11 location, and the risk of its occurrence at the location of wind farm Kostolac, the Ćirikovac locality is generally low. The results of an independent analysis of laboratory and CPT test data are inconsistent. One of the reasons is the assumption that the level of groundwater is on the surface of the terrain and the other cause of this certainly lies in the sampling method, continuous and discrete. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac- the Ćirikovac locality showed that there is a potential for the occurrence of liquefaction in the existence of conditions for the initiation of liquefaction, and the danger is defined as "very likely" according to the probability of events and the index of the liquefaction potential. Analysis of the liquefaction potential for the location of the wind turbine at the location of Ćirikovac has shown that there is a high probability of ~ 13% for the occurrence of liquefaction. The analysis shows that the last 8 meters to the surface of the terrain are the key to the occurrence of liquefaction, and by the appropriate method of foundation the expected effects of liquefaction on vertical subsidence can be significantly reduced.

For the location of the facilities of the wind farm in Kostolac – ***locality Petka*** the categorization has determined that the soil conforms to soft soil according to Serbian standard and according to EN 1998-1 soil type D. The type of spectrum is I based on magnitude of the competent earthquake.

Altogether 3 CPT tests were performed at Petka site. By analyzing the data of all 3 CPT experiments, the index of the liquefaction potential values was very low, so its occurrences at the location of the wind farm Kostolac site for location Petka is low. The results of an independent analysis of laboratory and CPT test data are inconsistent. Cause of this certainly lies in the sampling method, continuous and discrete. Analysis of the conditions for the occurrence of liquefaction at the site of wind farm Kostolac- the Petka locality showed that there is a potential for the occurrence of liquefaction in the existence of conditions for the initiation of liquefaction, and the danger is defined as "very likely" according to the probability of events and the index of the liquefaction potential. Analysis of the liquefaction potential for the location of the wind turbine 9 at the location of Petka has shown that there is a high probability of ~ 19% for the occurrence of liquefaction. The analysis shows that the last 4 meters to the surface of the terrain are the key to the occurrence of liquefaction, and by

the appropriate method of foundation the expected effects of liquefaction on vertical subsidence can be significantly reduced.

The control calculation benchmark for all four micro-locations showed that the proposed parameters of the specific spectrum for the location Kostolac containing the expected spectral acceleration as for distant as well as maximum local earthquakes.

The intensity of seismic hazard in the subject area is in the 7 °MCS zone, and a more detailed analysis of the seismic characteristics of the location of the planned wind farm Kostolac is elaborated in point 2.2.5. of the Study, and all construction works and materials should be aligned with the values obtained in the analysis of the local soil response to the seismic effect done within the detailed Seismic micro-landscaping of the terrain at the boundary of the Project.

8. ENVIRONMENTAL PROTECTION MEASURES

In designing, constructing and exploiting of the Kostolac wind farm, it is necessary, in addition to the measures included in the Preliminary Design and defined by the equipment specification of the manufacturer, to apply the appropriate environmental protection measures that are listed below.

8.1. Measures during the connstruction

- during the construction of the planned facilities and the accompanying infrastructure, it is obligatory to respect all the acquired conditions of the competent institutions and the measures that have been incorporated on the basis of them in the Project in question;
- the base of the pillars of each wind generator should be built and secured in a concrete deposit and in such a way that mammals that live underground cannot dig beneath them, and which are the potential prey of the birds
- the land around the concrete foundation of the pillars and the land on which the cables are installed must be repaired after the completion of the works and returned to the previous purpose;
- all installations must be earthed and properly insulated to prevent, or minimize, the harm to wild species;
- the accompanying facilities (substations, distribution boxes, etc.) must be constructed as to prevent the settlement of birds and bats;
- the disposal of agricultural and all other forms of organic waste in the area of the wind farm is prohibited;
- the wind farm should be equipped/organized so as to ensure continuous monitoring of the migration of birds and bats over the territory it occupies;
- the construction of buildings, the execution of works, or the carrying out of the technological process, can be carried out provided that no permanent damage, pollution or other degradation of the environment is caused;
- during the execution of construction works, in order to protect the health and life of people, all occupational safety measures prescribed for the intended type of work must be carried out;
- organize the site in such a way as to prevent any penetration of harmful substances into water, air and soil;
- for the needs of the personnel involved in the construction it is necessary to provide portable chemical toilets and their regular maintenance and discharge by an authorized legal entity;
- настали грађевински, комунални и остали отпад мора се отпремити са локације на за то предвиђену локацију у складу са важећим прописима, што треба дефинисати у Пројекту за извођење; the generated construction, municipal and other waste must be dispatched from the location to the designated location in accordance with the applicable regulations, which should be defined in the Detailed design;
- the movement of mechanization and vehicles during construction should be limited to the design areas of roads and access roads;
- from all surfaces where oily or other liquids that can be pollutants may occur, provide a closed collecting and discharging system;

- all surfaces damaged during the execution of the works must be repaired after the works have been completed;
- in the event of damage and spill of motor oil and fuel, the damages must be repaired and the polluted land evacuated and deposited under the conditions of the competent utility service;
- removed humus or soil of similar characteristics (if any) should be separately deposited, protected from the pollution and after the completion of the works use it for the purpose of horticultural arrangement of devastated surfaces;
- for workers involved in construction for sanitary purposes and for the storage of parts and equipment, organize mobile container facilities that should be removed from the site after the works have been completed;
- during the realization of the project achieve noise protection by good site organization and using machinery that does not create great noise;
- the construction of facilities shall be carried out in accordance with the applicable technical norms for construction, with the application of technologies that meet the prescribed environmental standards;
- in the event that in the course of earthworks, a natural good that is geologically-palaeontological or mineralogical-petrographic origin is found, which is presumed to have the status of a natural monument in accordance with Article 99 of the Law on Nature Protection (Official Gazette of the RS No. 36/09, 88/10 and 91/10), the contractor is obliged to inform the Ministry of Environmental Protection within eight days and take all measures so that the natural good could not be damaged until the arrival of the authorized person;
- in the event that in the course of earthworks the archaeological site or material remains of culture is found, the contractor is obliged to immediately suspend it and notify the competent institution for the protection of cultural monuments, and to ensure that, by the arrival of the expert team, the damage or destruction of the findings in accordance with Article 109 paragraph 1 of the Law on Cultural Property (Official Gazette of the RS, No. 71/94, 52/2011 - other laws and 99/2011 – the second law);
- the foundation of the wind turbine must be carried out in accordance with the requirements of the manufacturer of the equipment, and special attention should be paid to the joint of the bearing pillar and foundation;
- collecting surface water flow from the surfaces on which the works are carried out through temporarily constructed drainage channels and precipitates in order to prevent direct entry into the natural recipient (soil), especially during the precipitation period;
- atmospheric wastewater generated by flowing from the manipulative surfaces of the site may potentially contain suspended matter and petroleum products. Provide the controlled acceptance of potentially contaminated atmospheric waters and their treatment in a precipitates or a separator of fats and oils to ensure that the quality of purified water meets the criteria prescribed for discharge into a particular recipient and removal by an authorized person;
- blades of the wind turbine shoud be marked for observation by day, alternating with red and white colours, so that the field at the top of the blade is red. In total, there should be two red fields. The height of the field must be 6 meters (Rules on airports "Official Gazette of RS", number 23/12);
- mark the pillar of the carriers of each wind generator as an obstacle for flying, for spotting at night and in conditions of reduced visibility by placing a flash lamp with white light, medium intensity "type A", for marking obstacles in air traffic at the top of the pillar (Airport Rules "Official Gazette of RS", No. 23/12 and 60/12).

- the holder of the right to dispose of the facility is obliged to submit a technical report on the determination of the coordinates in the WGS-84 coordinate system, as well as the absolute and immediately after the construction of the facility, to the Directorate of Civil Aviation of the Republic of Serbia and the Air Traffic Control Agency of Serbia and Montenegro, the relative height of the objects, for the purpose of publishing them in an integrated airborneinformational package;
- windgenerators must be equipped with devices for protection against lightning strikes (lightning rods);
- take measures that will prevent the creation of ice on the blades of the wind turbine in the period when its it is possible;
- construct the facilities in accordance with the Law on Fire Protection (Official Gazette of RS, No. 111/09) and other related legal and sub-legal acts in accordance with the conditions of the Ministry of Internal Affairs - Emergency Situations Sector;
- provide an access route for fire-fighting vehicles in accordance with the provisions of the Rules on technical standards for access roads;
- the implementation project foresee the way of constructing and using a TDP that will not adversely affect the quality of water, the coastal plant and animal world and the emergence of erosive processes by Detailed design;
- the implementation project foresee the way of constructing and using of the docking bay that will not adversely affect the quality of water, the costal and water plant and animal world and the emergence of erosive processes by Detailed design;
- the transhipment of the equipment at the TDP shall not be carried out between the half of March to the end of June and from the beginning of October to the end of November, during the migration and nesting cycle of birds;
- at the sites of temporary disturbance of vegetation, the eradication of trees and shrubs is not permitted, in order to prevent soil erosion and allow faster spontaneous renewal of vegetation;
- during the construction phase, monitor the implementation of the defined protection measures for this phase of project implementation;
- all facilities must be built in accordance with the applicable legal and by-law acts regulating the specific area.

8.2. Protection of substation complex measures

- by technical solution, prevent the release of transformer oil into water and soil. The collecting pit, pipelines, collecting channels must be waterproof and protected from the hazard spillage and penetration into the underground aqifers;
- use a special system of oil pits, separators and absorbent wells of atmospheric waters. The system must be closed and oil from the separator should be transported to the tanks for further processing;
- transformers to be installed outdoors and provide reinforced concrete foundations, separated from other buildings. Directly between concrete (base walls) and its sides to build concrete tanks for receiving any oil;
- any oil spilled must be collected in the lowest part where there is a manhole from which, through the oil sewer pipe (which must be resistant to high temperature), it is taken to the oil pit;
- the oil pit should be constructed so that it ensures the separation of oil from water and the removal of clean water into an absorbent well;

- the oil pit must be waterproof and have sufficient capacity to receive the total amount of oil from the transformer, including the total amount of atmospheric water and firefighting water entering the oil pit through the transformer tank;
- dispose of the concentrative material for transformer oil in accordance with the regulations, entrust to the company with accreditation for the manipulation, transport and permanent disposal of hazardous waste;
- the grounding system of the medium voltage plant, as a lightning protection system, should in all cases be aligned with the grounding system and the lightning protection system of the connection distribution system;
- fire wall is realized between two transformers (transformers tanks), from reinforced concrete in the width of the tanks, ie the foundation of the transformer and height according to the foreseen size;
- build a sanitary facility and a waterproof septic tank at the substation facility, which will be discharged by the competent public utility company;
- in the zone of the substation, near the collecting pit, envisage the production of an appropriate number of piezometers for monitoring the level and quality of groundwater, according to the hydrogeological characteristics of the soil.

8.3. Measures during the operation

- regularly maintain all equipment and devices, especially mechanical parts of the turbine (lubrication, cleaning, etc.). In the event of regular maintenance of the plant and possible installations of new equipment and devices, care must be taken not to come of disposal of waste oils and lubricants on the ground, and if this occurs, immediatelly repair the damage;
- in case of any failure that can significantly increase the noise level, it is necessary to limit or discontinue operation and to repair the damage;
- limit or interrupt the operation of the wind generator in the period of strong winds in accordance with the technical characteristics prescribed by the manufacturer of the equipment;
- when installing new equipment, one of the essential parameters should be the acquisition of noise data, as well as the purchase of small-scale equipment in accordance with the requirements of the EU Directive of reducing the emitted sound power (Directive 2000/14 / EU on the noise emission of equipment used in the open air area). Upon commissioning, measurements should be made of the influence of noise arising in the area as a result of the operation of new equipment;
- equip the wind farm with equipment for monitoring birds and bats; provided equipment should be according to Rule book for special technical solutions providing secure and uninterrupted communication of wild life (Republic of Serbia Offical Gazzette No. 72/10 from October 2010);
- the obligation of the investor is the implementation of post-structural monitoring of the situation and possible endangerment of ornithofauna and hiropterofauna with appropriate equipment whose technical characteristics and precision of the measurement would be determined in accordance with the first observations immediately after the construction and at the very beginning of the exploitation phase and which will be immediately installed;
- the results of post-construction monitoring must be submitted on an annual basis to the Institute for Nature Protection of Serbia. The report should contain photographs of

possibly dead birds, the exact location and time of finding, the distance from the wind turbine and weather conditions;

- depending on the results of post-structural monitoring, if necessary, and in cooperation with the Institute for Nature Conservation of Serbia, plan compensatory measures:
  - the establishment of new or revitalization of existing sites where species that may be damaged are living,
  - measures of active protection of species, such as setting up nesting platforms and money compensations;
- if it is noticed that birds in large numbers and regularly are gathering in certain locations in the vicinity of wind turbines, or that they are attracted to certain objects (different pillars, trees, wild dumps, etc.), it is necessary, with prior consultations with the Institute for Nature Conservation, to remove objects from the location of the wind farm or apply technical and organizational measures to prevent the retention and gathering of birds;
- possible dead animals, primarily mammals and birds, is necessary to regularly remove from the location of the wind farm;
- it is necessary to periodically measure the noise intensity at the location and near the closest residential buildings;

8.4. Waste management measures

- provide the necessary space, the necessary conditions and equipment for collection, classification and temporary storage of waste materials in accordance with the Law on Waste Management ("Official Gazette of RS", No. 36/2009, 88/2010) and other regulations regulating the treatment with different types of waste;
- collect hazardous waste (waste oil), store it safely in closed containers in a specially designated place in accordance with the Regulations on the manner of storage, packaging and labeling of hazardous waste (Official Gazette of RS, No. 92/2010). Collected waste oil is handed over to the authorized organization with which the contract is concluded and which has a valid permit for hazardous waste management (storage, treatment, disposal);
- collected solid waste (secondary raw materials) is classified and disposed of in separate containers. The secondary raw material is handed over to the authorized organization with which the contract is concluded and which has a valid permit (storage, treatment, disposal);
- it is not allowed to dispose of waste materials on the uncovered and non-concreted space in the wind farm;
- the landfill of the land surplus that occurs during the execution of construction works shall be provided from the washing and dismantling and, at the latest after the completion of the works, evacuate from the site and deposited in the place and under the conditions of the competent utility service;
- all specified waste management measures should be precisely defined in the Detailed design.

8.5. Accident protection measures

- before the start of the operation of the wind farm, develop an Action Plan in the accident situations that should contain (1) the scheme of the response to the accident,

(2) the training program, (3) the control program, (4) other instructions and notices. This Plan will determine which activities are to be undertaken in cases of accidents, which external institutions are notified and how the consequences are corrected;

- force for the implementation of the Plan should include (1) workers in charge of managing the operation of the wind farm at the moment of the accident, (2) other workers who are not in the shift, (3) the competent fire department;
- regularly conduct adequate training of employees that should include and identify disruptions in the operation of wind turbines (unusual sounds from pillars, gondolas or blades) and how to act in such cases;
- during periods of strong wind (usually for wind speeds greater than 25 m/s) wind turbines are automatically stopped and maintained in braked state (due to possible damage to equipment and devices);
- establish a comprehensive program of preventive maintenance and monitoring of key parts of the wind turbine to reduce the risk of the occurrence of failures and potential accidents;
- regularly maintain electrical components and rotating parts in the gondola and thus reduce the risk of temperature rise or spasms (and fires) in the gondola;
- in exceptional cases that can occur (fracture of the blade, fall of the wind turbine) completely remove the generated waste and safely dispose of it. Perform rehabilitation of damaged land and compensation for (eventual) damage done;
- install an automatic fire detection system that will ensure the shutdown of the electricity transmission system as soon as possible;
- the fire scenario on wind generators is a general-type risk and is subject to separate fire protection analyzes by authorized institutions. The fire protection report is a separate part of the project documentation and determines the method of response in case of fire and appropriate protection measures;
- the zone immediately around the wind generator must be a zone where smoking is prohibited and accordingly marked;
- in the case of spillage of dangerous substance, collect the used sorbent and deposit according to the Rulebook on the manner of storage, packaging and labeling of hazardous waste (Official Gazette of RS, number 92/2010);
- in case of degradation of soil and water, it is necessary to make remediation or otherwise rehabilitate the degraded environment in accordance with the rehabilitation and remediation project.

8.6. Measures for preventing and mitigating the impact during the closure of the wind farm

The planned life cycle of the wind farm is about 25 years. After this period, the turbine could be replaced or the closure and removal of the plant. Protective measures during the period of closing and removal of the wind farm contain the same or similar requirements as protection measures during the performance of works and the installation of wind turbines. In that sense, the measures mentioned in the case of construction concerning the protection from noise, traffic management, protection of habitats, flora and fauna, protection of land and groundwater, protection against air pollution, can also be applied in case of closing and removal of the wind farm.

Before the removal of the plant begins, it will be necessary to make a General project for closing and removing of the facilities that will include a detailed plan for the rehabilitation of

the area of former wind farm. As part of the general project, it will be necessary to formally establish a list of protective measures and requirements that need to be met, based on possible specific conditions that may arise at that time. The mentioned project will need to be harmonized with the Conditions of the competent institutions. The project with a recovery plan should be accepted by the competent environmental authority as well as all other stakeholders (including the financial institutions that participate in the project financing).

It is necessary to implement several general measures (principles) of protection which are necessary to be applied in the phase of termination of the project, which are:

- before removing the wind farm and clearing the site, re-execute an ecological location analysis to determine whether special measures and activities are required, depending on the identified species and their habitats;
- during the works, form the central warehouse, by surface and structure, as well as the warehouse during the execution of the works;
- production units and objects are to be removed and shipped from the location. All materials and parts of equipment suitable for reuse are recycled and renewed;
- degrade the concrete foundation to a depth of 1 meter. All waste material should be removed from the site and disposed of in accordance with the regulations governing the treatment of waste;
- rehabilitate the land and restore it to the state as before the existence of a wind farm;
- after the installation is terminated, the production units will be removed and shipped from the site, and all materials and parts of the equipment suitable for reuse will be recycled and renewed.

It is forbidden to:

- discharge or spill the waste oils into or onto land, surface and groundwater and sewage;
- disposal of waste oils and uncontrolled release of residues from the processing of waste oils;
- any kind of waste oil treatment that pollutes the air in concentrations above the prescribed limit values;
- discharge of purified oily wastewater into an absorbent well, and discharging the transformer oil into atmospheric or any other sewerage, into groundwater, as well as on surrounding land.

The producer of waste oil, depending on the quantity of waste oil it produces annually, is obliged to provide a receiving place until delivering for the treatment to the person for whom the permit is issued. Owners of waste oils other than waste oil producers are obliged to hand over waste oil to the person who collects and treats it. The person who collects, stores and treats waste oils must have permission for keeping and keep records of waste oils and the amount that has been collected, stored or treated, and the final disposal of residues after treatment.

9. ENVIRONMENTAL IMPACT MONITORING PROGRAM

In order to realize the defined protection measures, it is necessary to control the implementation of planned, urban and project solutions in all phases of project realization (in the construction phase, exploitation and after the completion of exploitation). Controls should be conducted by relevant institutions for each individual project area.

According to the Law on Environmental Protection, the level of noise in the environment is controlled by the systematic noise measurement provided by the municipality. Noise measurements are performed by authorized professional organizations in accordance with the Law on Environmental Noise Protection (Official Gazette of RS, No. 36/09 and 88/10) and the relevant by-laws.

During the construction period of the wind farm, and especially after the commissioning of the wind farm, it is necessary to actively monitor the state and impact of the facility and its work on the elements of bird and bats fauna in the period of at least one year. In that sense, it is necessary to provide a field works of the object concerned and the surrounding belt for the collection of data and possibly killed specimens of birds and bats. Monitoring must include recording of the number and determination of the types of dead or wounded birds and bats resulting from the operation of the wind farm. In this context, it is necessary to observe in particular the space within a radius of 100 meters from each individual wind generator every 7 days (in the period from February 1 to May 1 and from August 1 to December 1), that is, every 14 days in other periods of the year. Monitoring must be carried out by a professional nature protection institution, and if necessary, other competent institutions may also be included in the monitoring report submitted to the Institute for Nature Conservation of Serbia.

In the event that in the course of the monitoring, injured specimens are found of species that are protected as natural rarities according to the Rulebook on the designation and protection of strictly protected and protected wild species of plants, animals and fungi (Official Gazette RS, No. 5/10 and 47/11), the investor must finance their transport and disposal at the appropriate Wildlife Refuge.

The further procedure would consist of the identification of these specimens, dissection and natural processing, and their preservation and storage in terms of evidence, but also for other professional and scientific purposes. For these purposes, the support and assistance of the Institute for Nature Protection of Serbia and the Natural History Museum in Belgrade could be provided, which are competent for their work with their capacities and expertise, as well as legal provisions.

In the event that the monitoring establishes possible facts about the impact of the facility and its functioning on the investigated natural values, it would be the duty and obligation of the monitoring entities to inform the initiators and project implementers, as well as the competent institutions about the situation. In that sense, timely measures would be taken to eliminate and prevent possible widespread consequences.

10. CONCLUSION

The Ministry of Agriculture and Environmental Protection of the Republic of Serbia, within its competencies and in accordance with the provisions of the Law on Environmental Impact Assessment (Official Gazette of the RS, No. 135/04 and 36/09), and upon the request of the project holder PE "Elektroprivreda Srbije", adopted a Decision determining the need for development and determining the scope and content of the Environmental impact assessment study of project of construction of wind farm on the locality of Kostolac (Decision No: 353-02-01621 / 2016-16, from 13.09 .2016).

For the needs of the Study, the project holder of the PE "EPS" conducted the public procurement procedure - JN/1000/0162/2016, after which the work was awarded to the company NETINVEST d.o.o. from Belgrade (Service Provider) and company EKO PLAN from Belgrade (member of the group), who gathered a multidisciplinary team for the development of the subject Study, which is usually a part of the documentation necessary in the process of obtaining approval for the construction and preparation of the remaining documentation.

Special attention in the preparation of the Study was devoted to the analysis of the state of the environment at the location where the construction of the Kostolac wind farm and its surroundings is planned. By the nature of the functioning, the wind farm can imply certain negative environmental impacts, both in the construction phase (temporary effects) and at the stage of its exploitation. The most dominant negative effects are possible in relation to the flying fauna, ie on ornithofauna and hiropterofauna. In this context, in the analysis of the situation, for the purpose of preventive protection of flying fauna, one-year monitoring of ornithofauna and hiroftofauna was done. On the basis of observations, the final spatial disposition of wind turbines was carried out, ie the displacement of certain pillars from the original locations, to locations where the possibility of endangering the flying fauna was minimized, and the results of performed observations were incorporated in the Study on Environmental Impact Assessment.

After analyzing the state of the environment and analyzing the technical documentation, a multi-criteria evaluation of the possible impacts of the planned Kostolac wind farm on environmental components was carried out using the "Leopold's matrix". For evaluation purposes, from a broader list of potential impact factors (threats) that can be expected for this kind of intervention in nature, 10 possible factors were identified as a result of project implementation activities. Impact factors were assessed separately for each component of the environment relevant to the scope of this Study, in relation to the magnitude of the impact, the importance of impact, the probability of impact, and the duration of the impact. Also, the physical, biological and socio-cultural characteristics of the environment at the site are separated, and within them a total of 16 components of the environment were defined.

Summarizing the impacts of the planned projects on the environment, it was found that they are acceptable and that they will be minimized using 89 taxativelly stated protective measures defined in the Study and the appropriate environmental monitoring program at the site in question.

In summary, the realization of the planned project involves the use of renewable energy, using clean technology for its exploitation. In the concrete case, it can be concluded that negative impacts of limited intensity and spatial extent have been identified and that adequate protection measures for their prevention or minimization are foreseen.

By planing the micro-locations of individual wind turbines based on the results of annual observations of ornithafauna and hyropterofauna, the principle of preventive protection has been achieved and optimal wind turbine positions have been achieved, ie the maximum in terms of protection of flying fauna.

Having in mind:

- the characteristics of the planned project and the state of the environment at the site,
- results of one-year monitoring of ornithofauna and hiropterofauna
- results of multi-criteria evaluation of planned activities on the environment and
- defined environmental protection measures and environmental monitoring program,

it is concluded that the project of the Kostolac wind farm, in the wider context, will have certain positive impacts on the quality of the environment, and that the smaller identified possible negative impacts will not burden the capacity of the area, especially with the application of defined protection measures that will be implemented at all stages of the project (during the construction, exploitation and after the end of use of the wind farm). It can be concluded from the above reasons that it does not represent a significant environmental pollutant, that its implementation is in the function of realization of the basic principles of sustainable development and that it is in accordance with the national policy in the field of application of renewable energy sources and the appropriate legilization in the field of nature and environment protection. Bearing all in mind, we consider that the Project in question is fully acceptable from the point of view of possible environmental impacts.

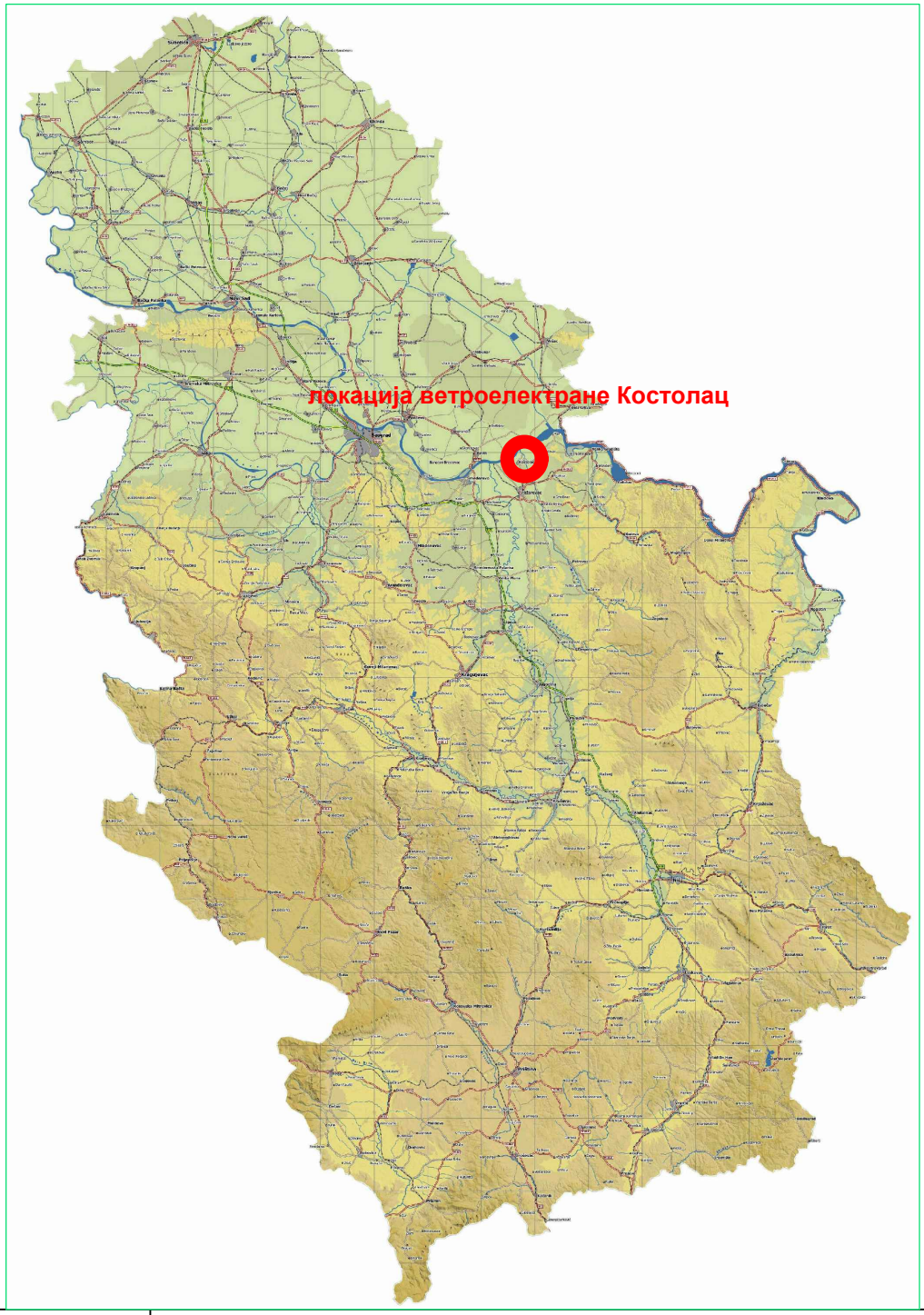
LEGAL REGULATIONS USED IN THE STUDY

- Law on Environmental Protection ("Official Gazette of RS", No. 135/04, 36/09 and 72/09 - 43/11 - Constitutional Court and 14/2016);
- Law on Environmental Impact Assessment ("Official Gazette of RS", No. 135/04 and 36/09);
- Law on Nature Protection ("Official Gazette of the Republic of Serbia", No. 36/09 and 88/10 and corrections 91/10 and 14/2016);
- Law on Air Protection ("Official Gazette of RS", No. 36/09 and 10/13);
- Law on Protection against Noise in the Environment ("Official Gazette of RS", No. 36/09 and 88/10);
- Law on Waste Management ("Official Gazette of RS", No. 36/09, 88/10 and 14/16);
- Law on Fire Protection ("Official Gazette of RS", No. 111/09);
- Law on Cultural Haritage ("Official Gazette of the Republic of Serbia", number 71/1994);
- Law on Energy ("Official Gazette of the Republic of Serbia", No. 145/14);
- Law on waters ("Official Gazette of RS", No. 30/10, 93/12 and 101/16);
- Law on Protection against Non-Ionizing Radiation ("Official Gazette of RS", No. 36/09);
- Law on Planning and Construction ("Official Gazette of RS", No. 72/09, 81/09 - correction, 64/10-US, 24/11, 121/12, 42/13-US, 50/13-US, 98/13-US, 132/14 and 145/14);
- Energy Development Strategy of the Republic of Serbia until 2025 with projections until 2030 ("Official Gazette of RS", No. 101/15);
- Decree on placing under control of the use and trade of wild flora and fauna ("Official Gazette of RS", No. 31/05, 45/05 - correction, 22/07, 38/08, 9/10 and 69/11);
- Rulebook on the compensation price list for determining the amount of compensation for damage caused by unauthorized activities in relation to strictly protected and protected wild species ("Official Gazette of RS", No. 37/10);
- Rulebook on special technical and technological solutions that enable unhindered and safe communication of wild animals ("Official Gazette of RS" No. 72/10);
- Rulebook on the conditions to be met by shelters for the management of protected wild animals ("Official Gazette of RS" No. 76/10);
- Rulebook on compensatory measures ("Official Gazette of RS No. 20/2010");
- Decree on requirements for monitoring and requirements for air quality ("Official Gazette of RS" No. 11/10, 75/10 and 63/13)
- Regulation on Limit Values of Emissions of Pollutants in the Air ("Official Gazette of RS" No. 71/10)
- Regulation on Noise Indicators, Limit Values, Methods for Evaluating Indicators of Noise, Disturbance and Harmful Effects of Noise in the Environment ("Official Gazette of RS", No. 75/10);
- Rulebook on the methodology for determining acoustic zones ("Official Gazette of RS", No. 72/10);
- Rulebook on the manner of storage, packaging and labeling of hazardous waste ("Official Gazette of RS", No. 92/2010);
- Rulebook on the content of the study on the environmental impact assessment ("Official Gazette of the Republic of Serbia", No. 69/05);
- Decree on Classification of Facilities, Activities and Land in Fire Categories ("Official Gazette of RS", No. 76/10);

- Amendments to the Rulebook on Technical Norms for the Construction of Structures in Seismic Areas (Official Gazette of SFRY, No. 59/90);
- Rulebook on sources of non-ionizing radiation of special interest, types of sources, manner and period of their examination ("Official Gazette of the Republic of Serbia", No. 104/09);
- Rulebook on the limits of exposure to non-ionizing radiation ("Official Gazette of the Republic of Serbia", No. 104/09);
- Decree on determining the list of projects for which the impact assessment is mandatory and the List of projects for which an environmental impact assessment can be requested ("Official Gazette of the Republic of Serbia", No. 114/08);
- Rulebook on permitted quantities of hazardous and harmful substances in soil and methods for their examination ("Official Gazette of RS", No. 23/94);
- Law on the Confirmation of the Environmental Impact Assessment Concentration in a Transboundary Context, ("Official Gazette of the Republic of Serbia - International Agreements", No. 102/2007);
- Law on the Confirmation of the Kyoto Protocol to the United Nations Framework Convention on Climate Change ("Official Gazette of the Republic of Serbia", No. 88/2007 and 38/2009);
- Law on the Confirmation of the Convention on the Conservation of Migratory Species of Wild Animals, ("Official Gazette of the Republic of Serbia - International Agreements", No. 102/2007).

GRAPHICAL ANNEXES

(macro and microlocation)



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Евиденциони број:	**PR/EPS-PUZS/16**		
Назив инвеститора:	**ЈП "Електропривреда Србије", Царице Милице 2, Београд**		
Назив објекта:	**Парк ветроелектрана инсталисане снаге 66MW**		
Ознака документације:	**Студија процене утицаја на животну средину**		
Ознака дела пројекта:	**Графичка документација**		
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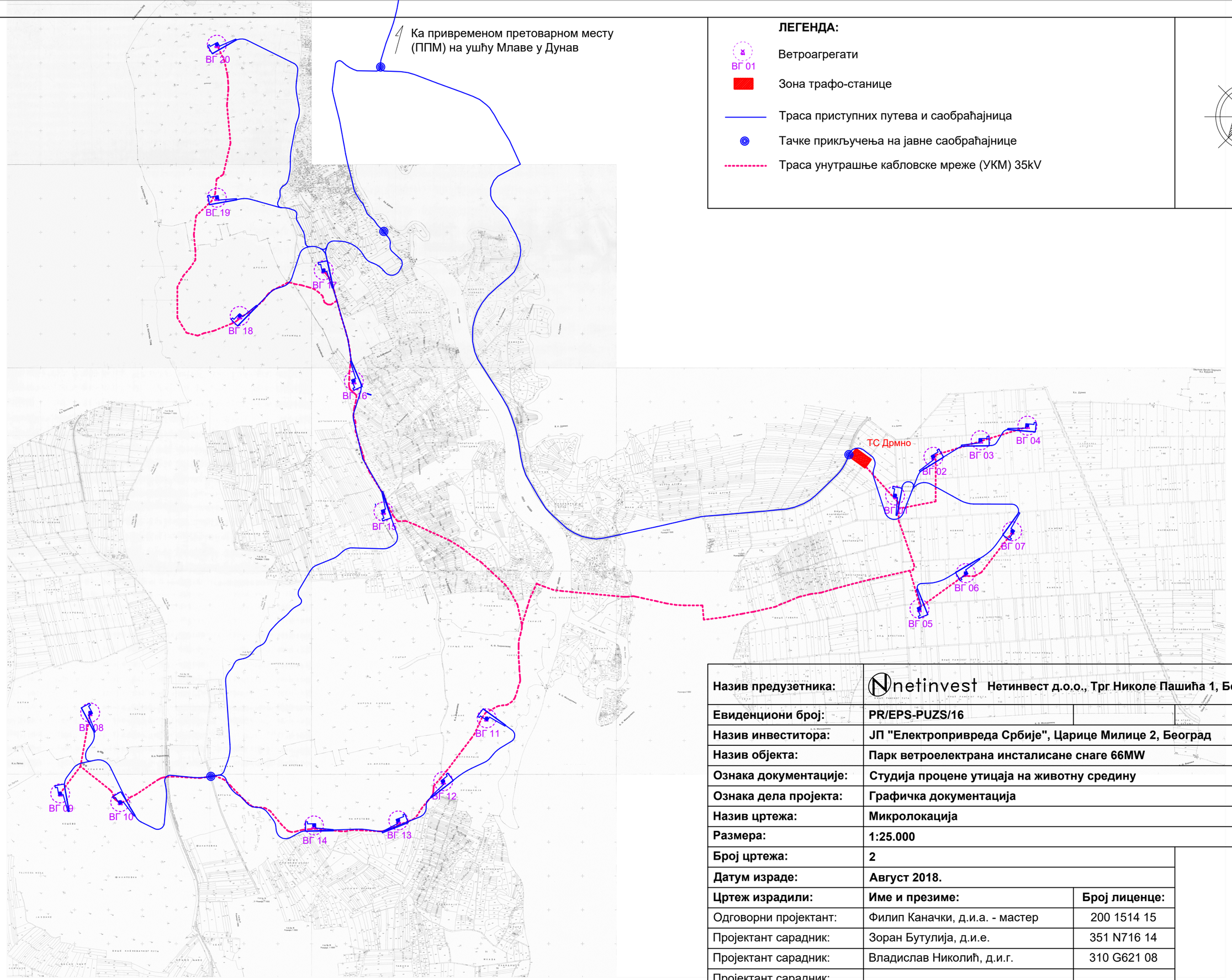
Одговорни пројектант:	Филип Каначки, д.и.а. - мастер	200 1514 15	
Пројектант сарадник:	Зоран Бутулија, д.и.е.	351 N716 14	
Пројектант сарадник:	Владислав Николић, д.и.г.	310 G621 08	
Пројектант сарадник:			



ЛЕГЕНДА:

ВГ 01 — Ветроагрегати

Зона трафо-станице

Траса приступних путева и саобраћајница

Тачке прикључења на јавне саобраћајнице

Траса унутрашње кабловске мреже (УКМ) 35kV

СЕВЕР

Назив предузетника:	**Netinvest Нетинвест д.о.о., Трг Николе Пашића 1, Београд**	
Евиденциони број:	**PR/EPS-PUZS/16**	
Назив инвеститора:	**ЈП "Електропривреда Србије", Царице Милице 2, Београд**	
Назив објекта:	**Парк ветроелектрана инсталисане снаге 66MW**	
Ознака документације:	**Студија процене утицаја на животну средину**	
Ознака дела пројекта:	**Графичка документација**	
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Одговорни пројектант:	Филип Каначки, д.и.а. - мастер	200 1514 15
Пројектант сарадник:	Зоран Бутулија, д.и.е.	351 N716 14
Пројектант сарадник:	Владислав Николић, д.и.г.	310 G621 08
Пројектант сарадник:		

ANNEX I

(Excerpt from one-year monitoring of ornithofauna and hiropterofauna - graphic attachments)

Прилог 2. Мапе прелета циљних врста птица

Легенда

директан лет

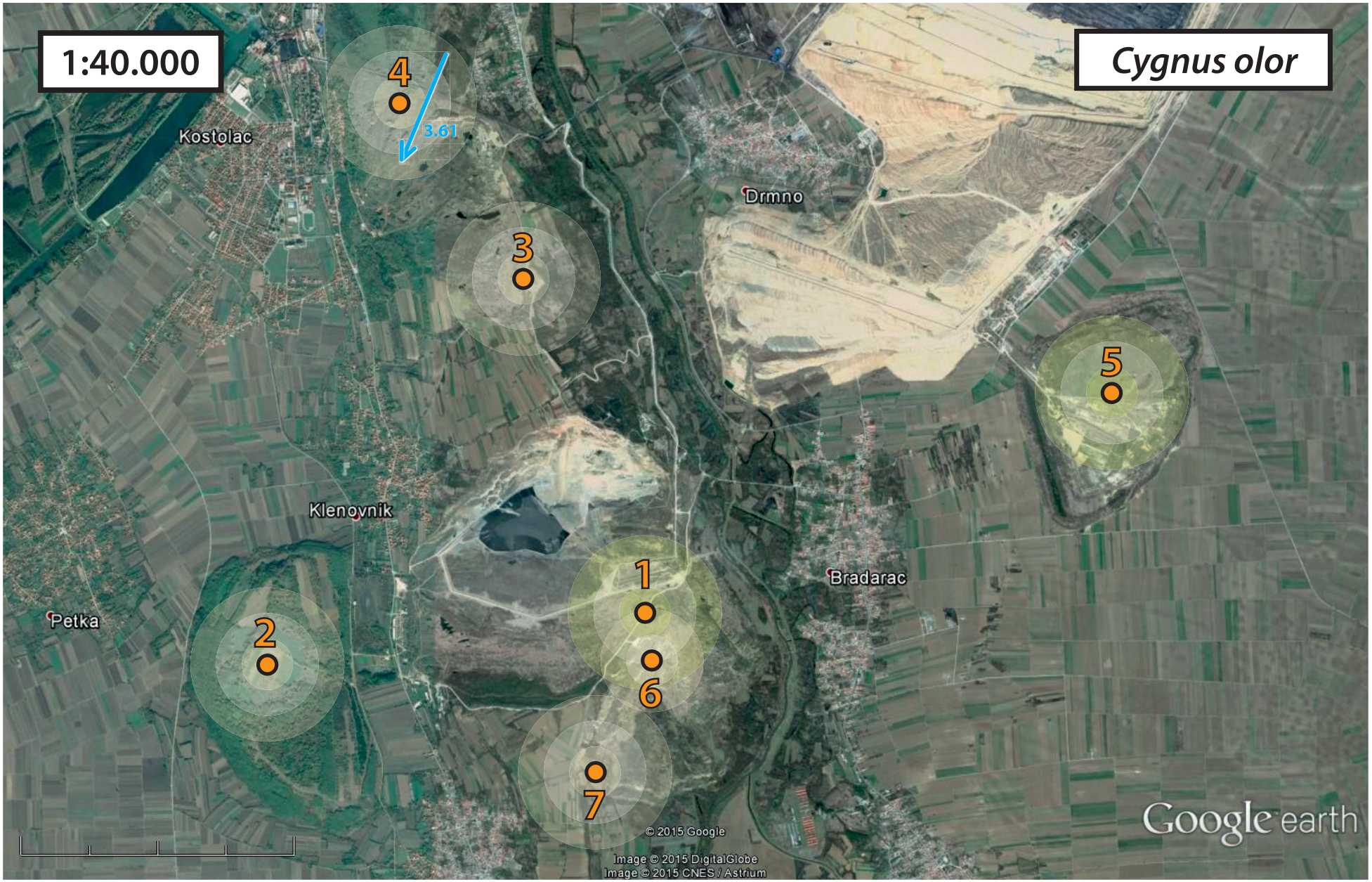
лов

кружење

стајање/слетање

1.14 лет на висини испод 50 или изнад 200 m

1.14 критичан лет на висини од 50 до 200 m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Cygnus olor
4
3.61
3
5
1
2
6
7
Kostolac
Drmno
Klenovnik
Bradarac
Petka
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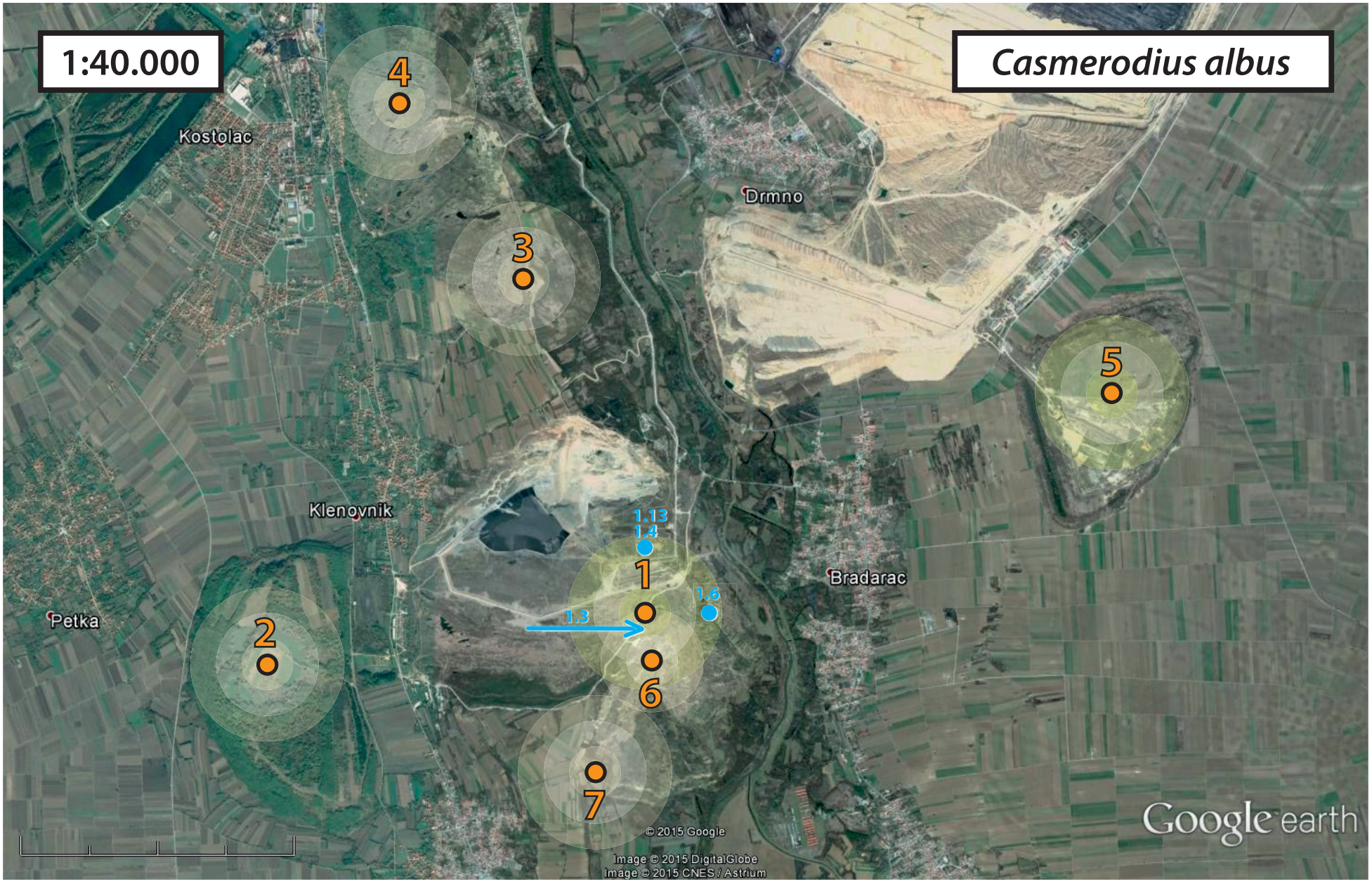
Google earth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Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
2
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1.13
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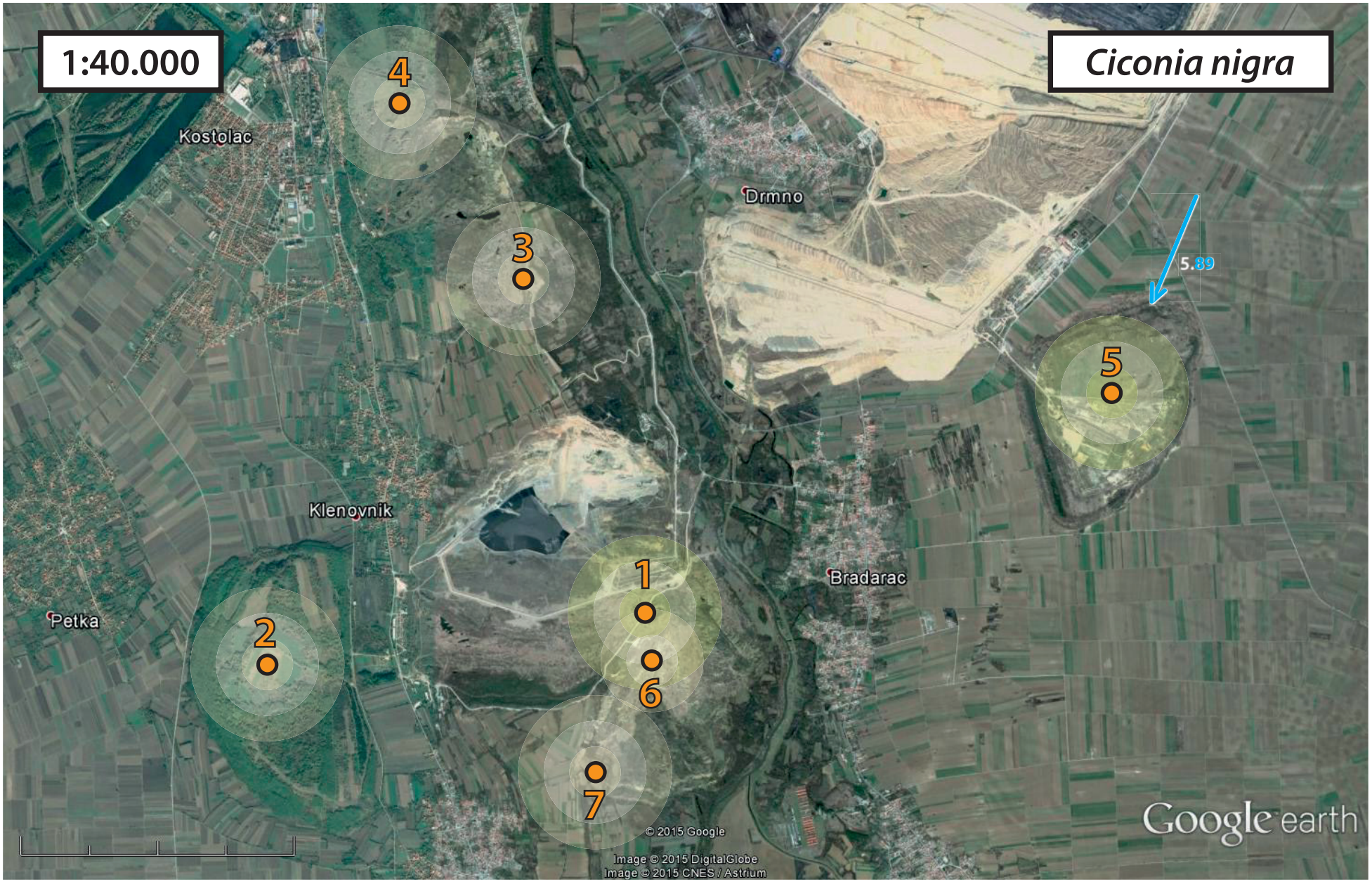
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Ciconia nigra
Kostolac
Drmno
Klenovnik
Bradarac
Petka
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3
4
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6
7
5.89
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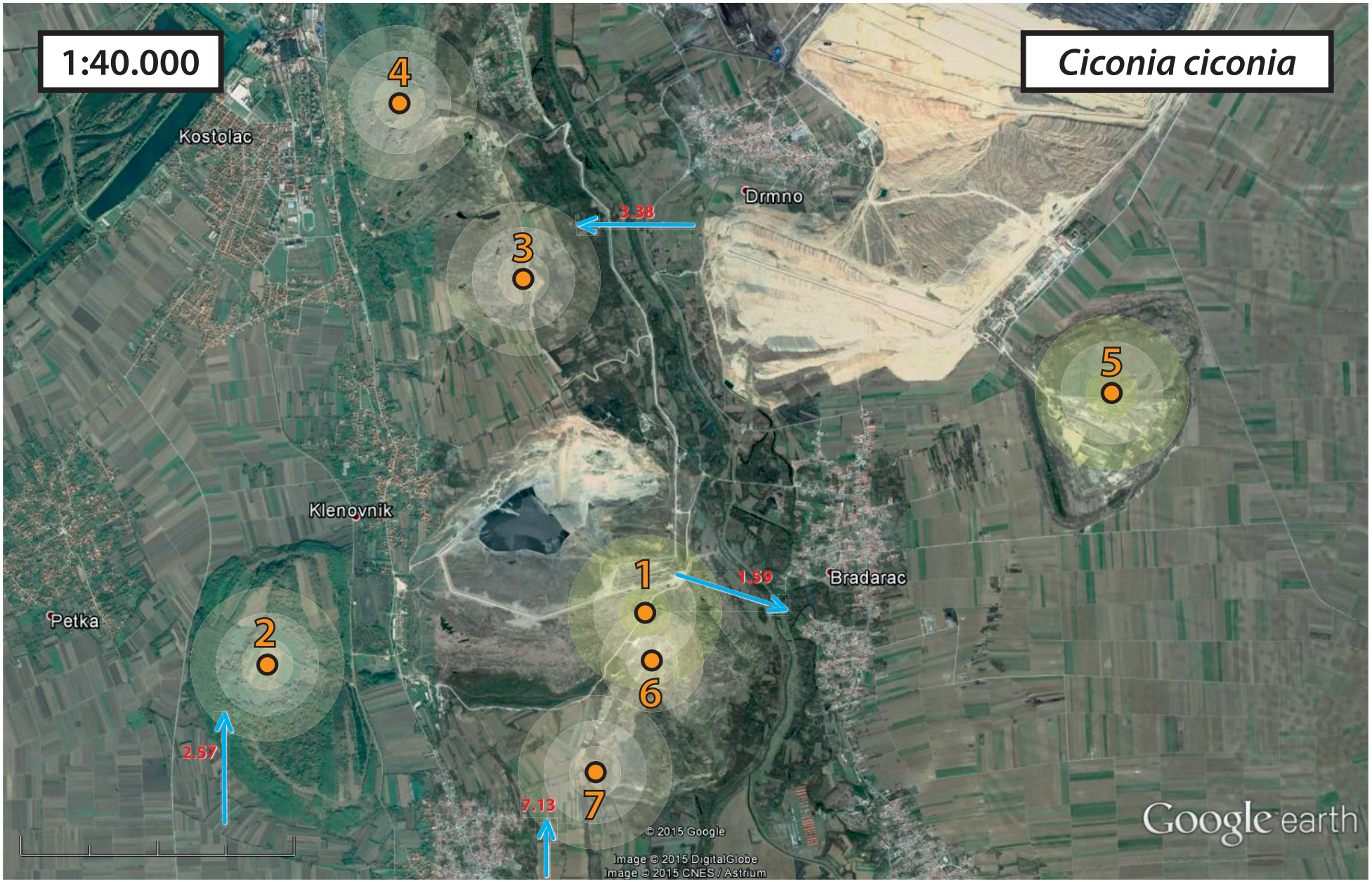
Google earth


1:40.000
Ciconia ciconia
Kostolac
Drmno
Klenovnik
Petka
Bradarac
1
2
3
4
5
6
7
3.38
1.59
2.57
7.13
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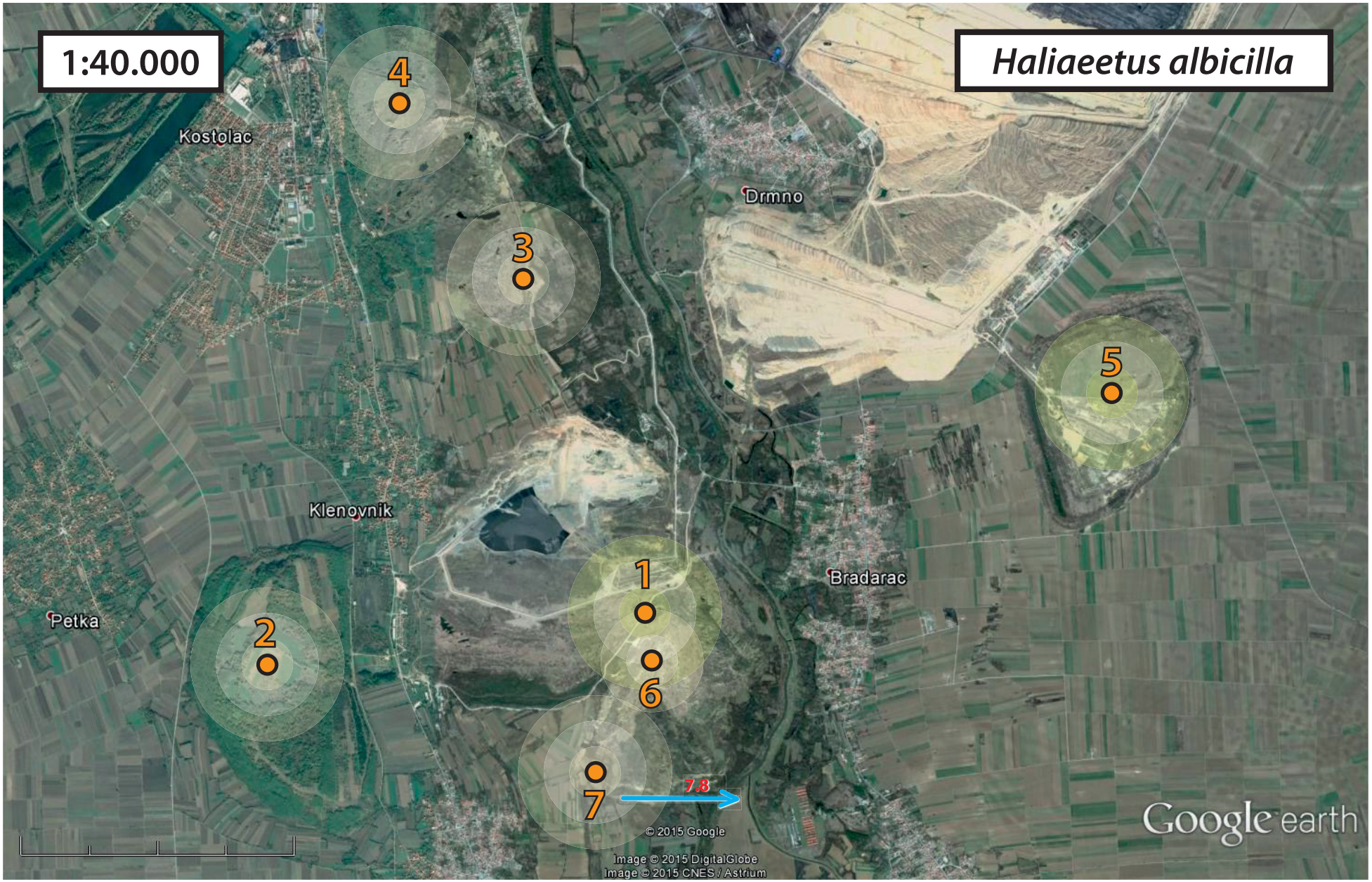
Google earth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Haliaeetus albicilla
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
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7.8
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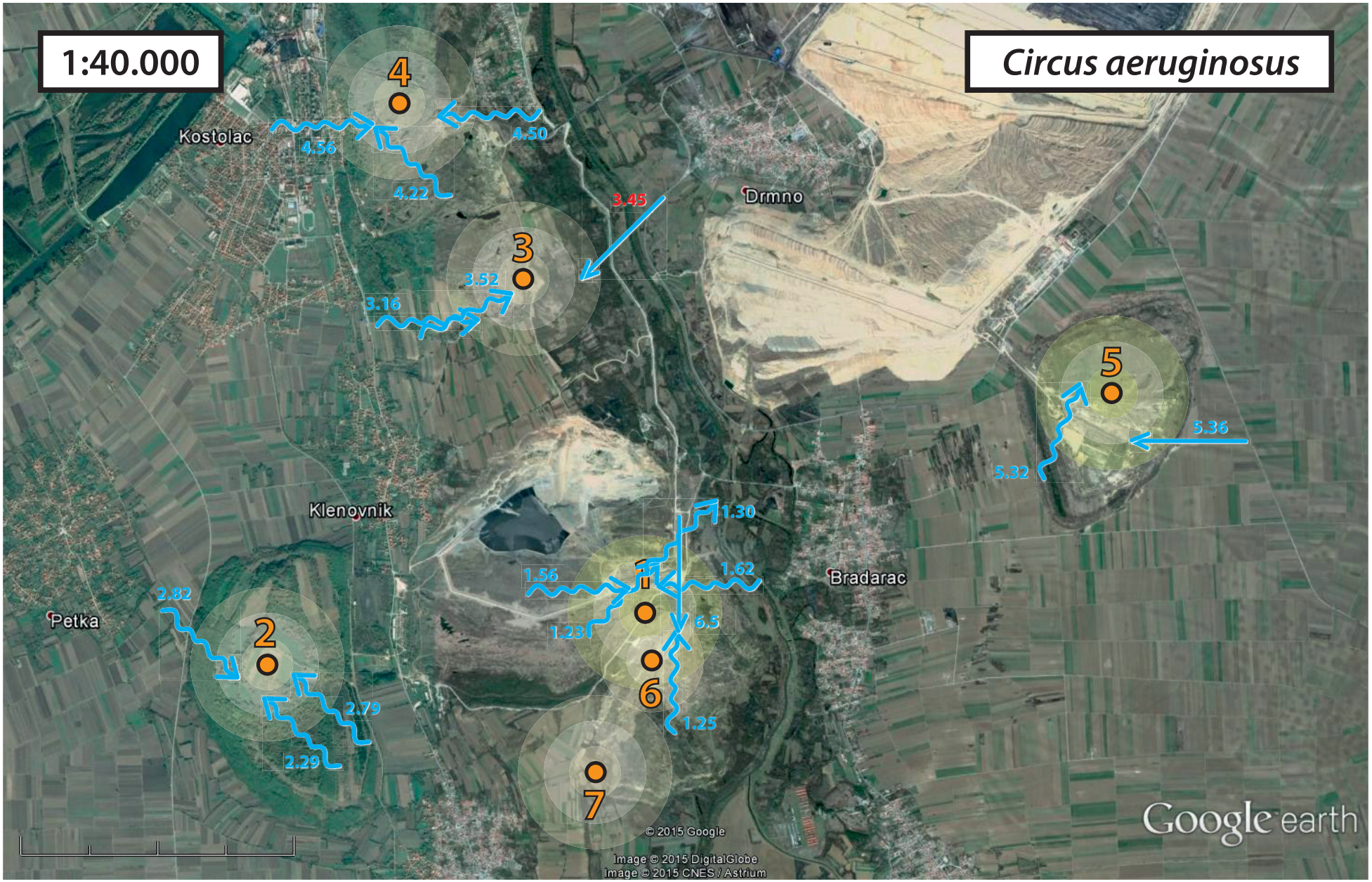
Google earth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Circus aeruginosus
Kostolac
Drmno
Klenovnik
Bradarac
Petka
4
3
2
1
5
6
7
4.56
4.50
4.22
3.45
3.52
3.16
5.36
5.32
1.30
1.56
1.62
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6.5
1.25
2.82
2.79
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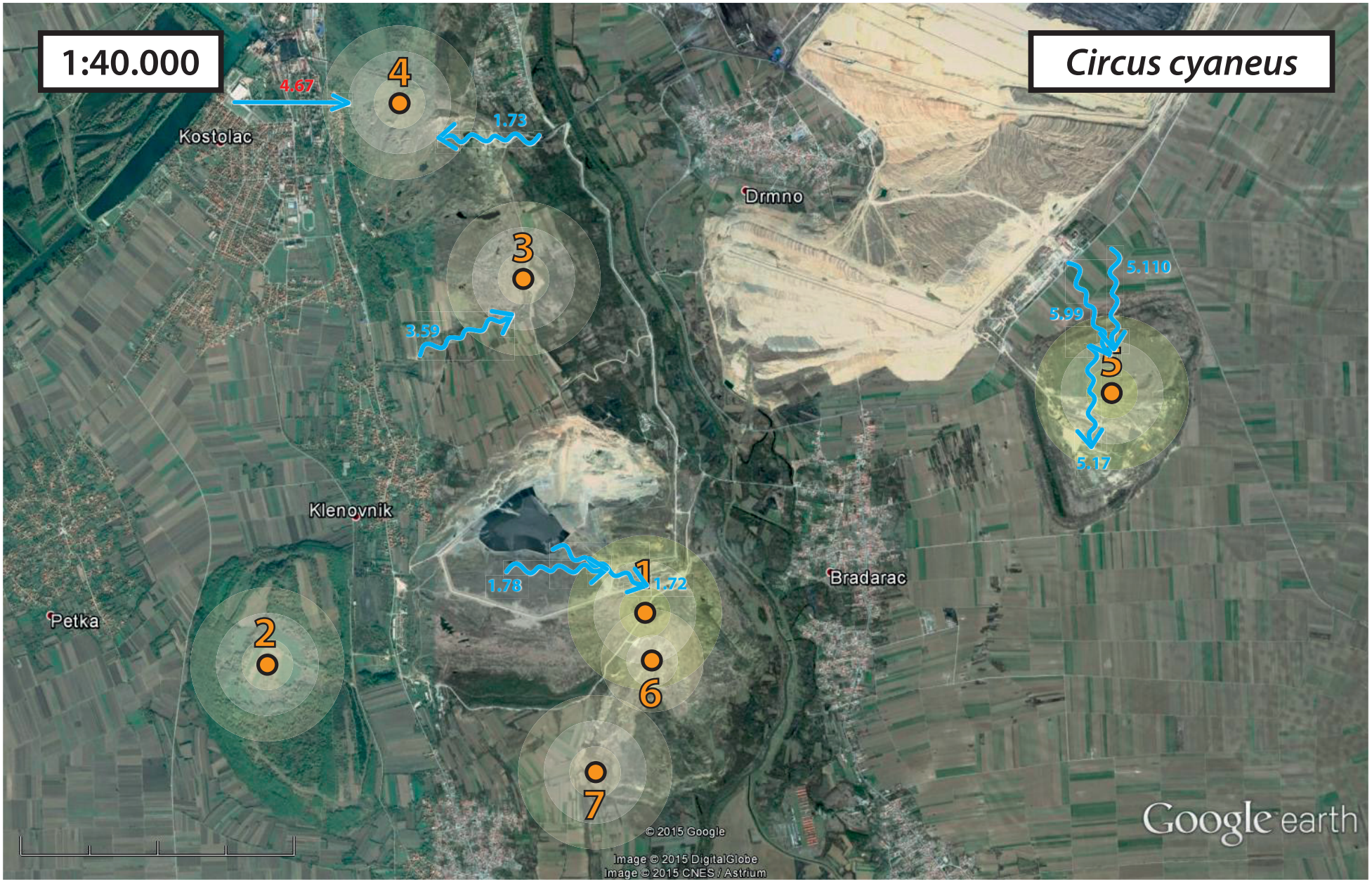
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Circus cyaneus
4.67
1.73
3.59
5.110
5.99
5.17
1.78
1.72
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
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7
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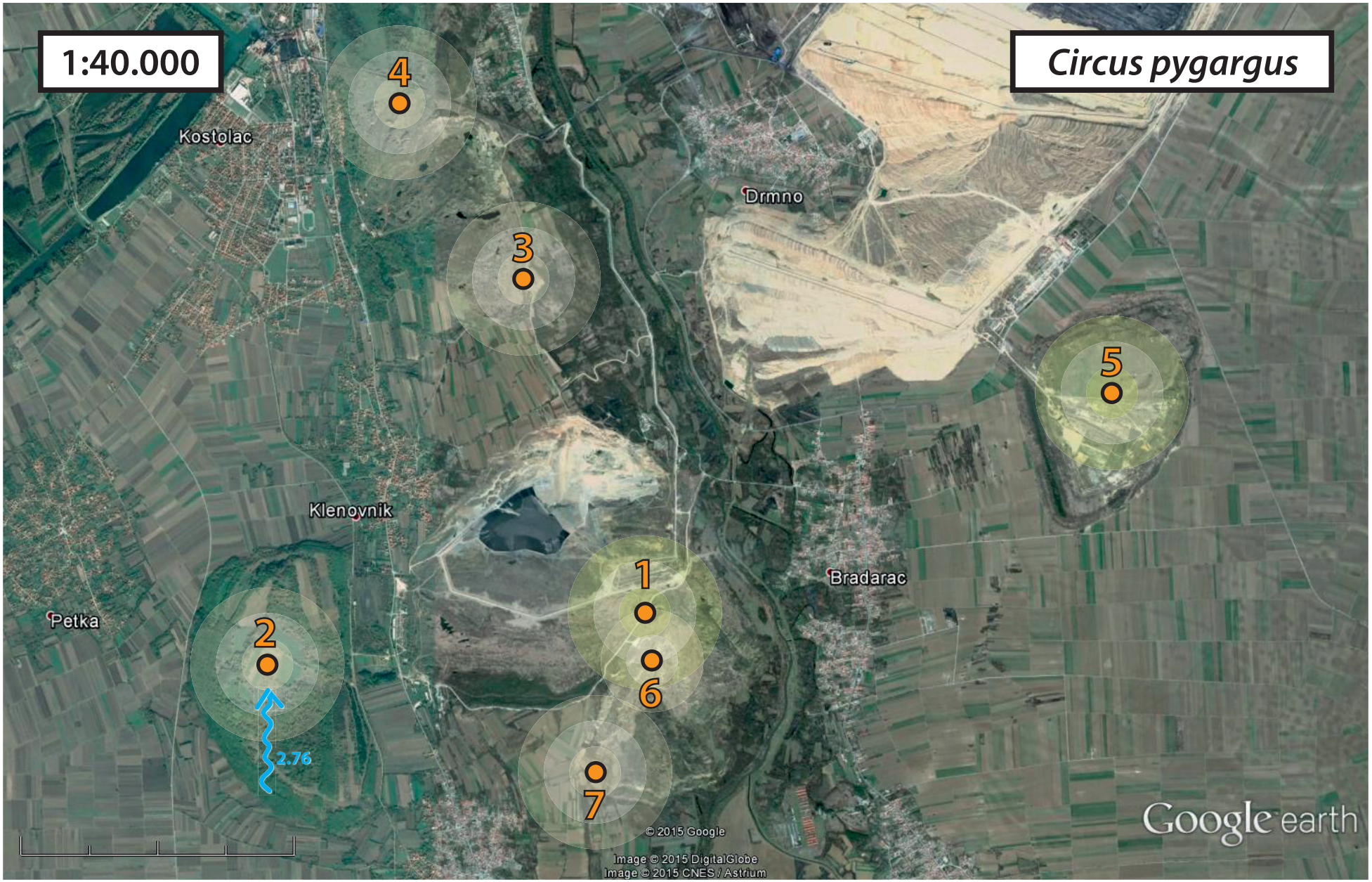
Google earth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Circus pygargus
Kostolac
Drmno
Klenovnik
Bradarac
Petka
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2.76
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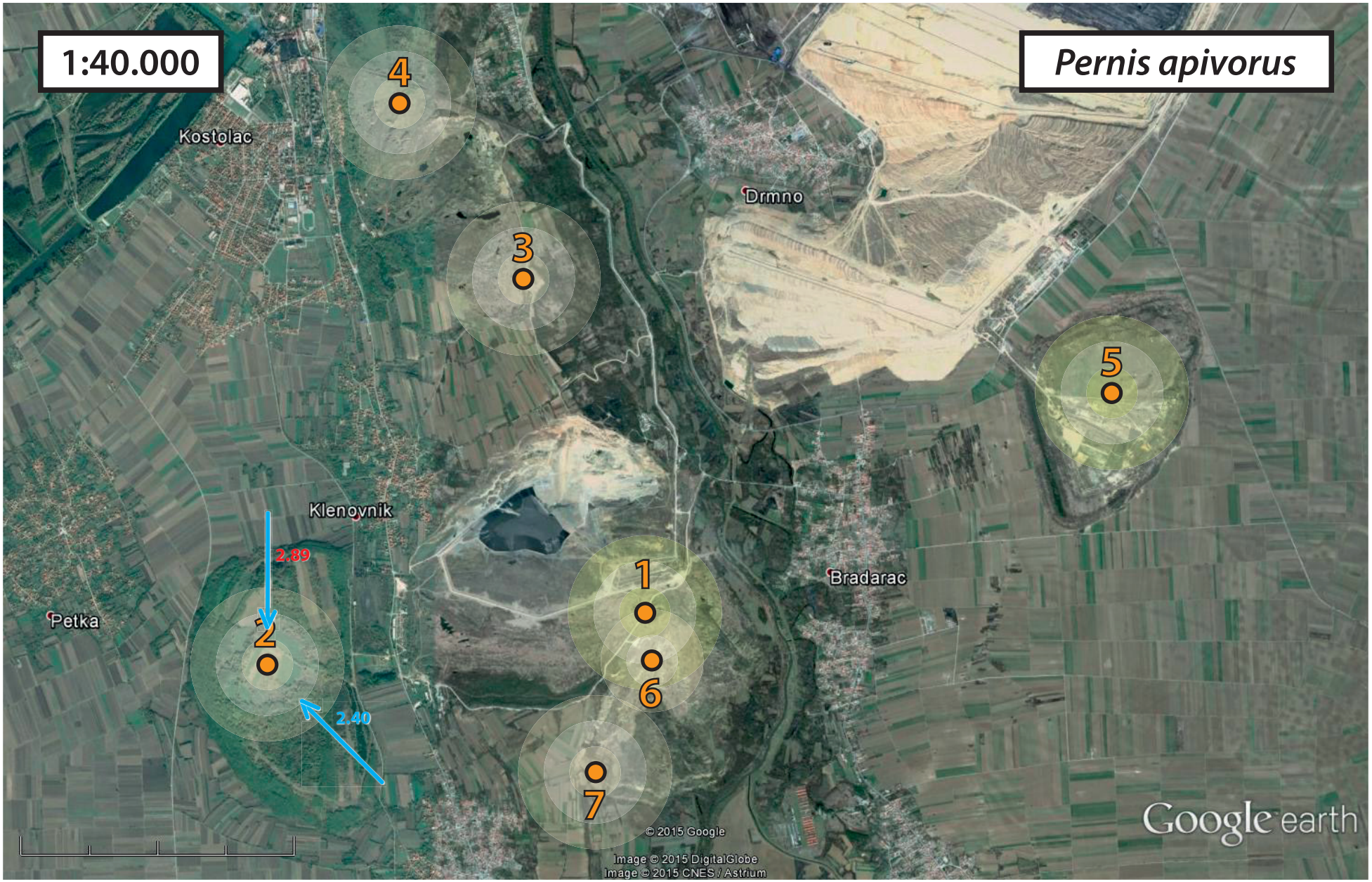
Google earth


1:40.000
Pernis apivorus
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
2
3
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5
6
7
2.89
2.40
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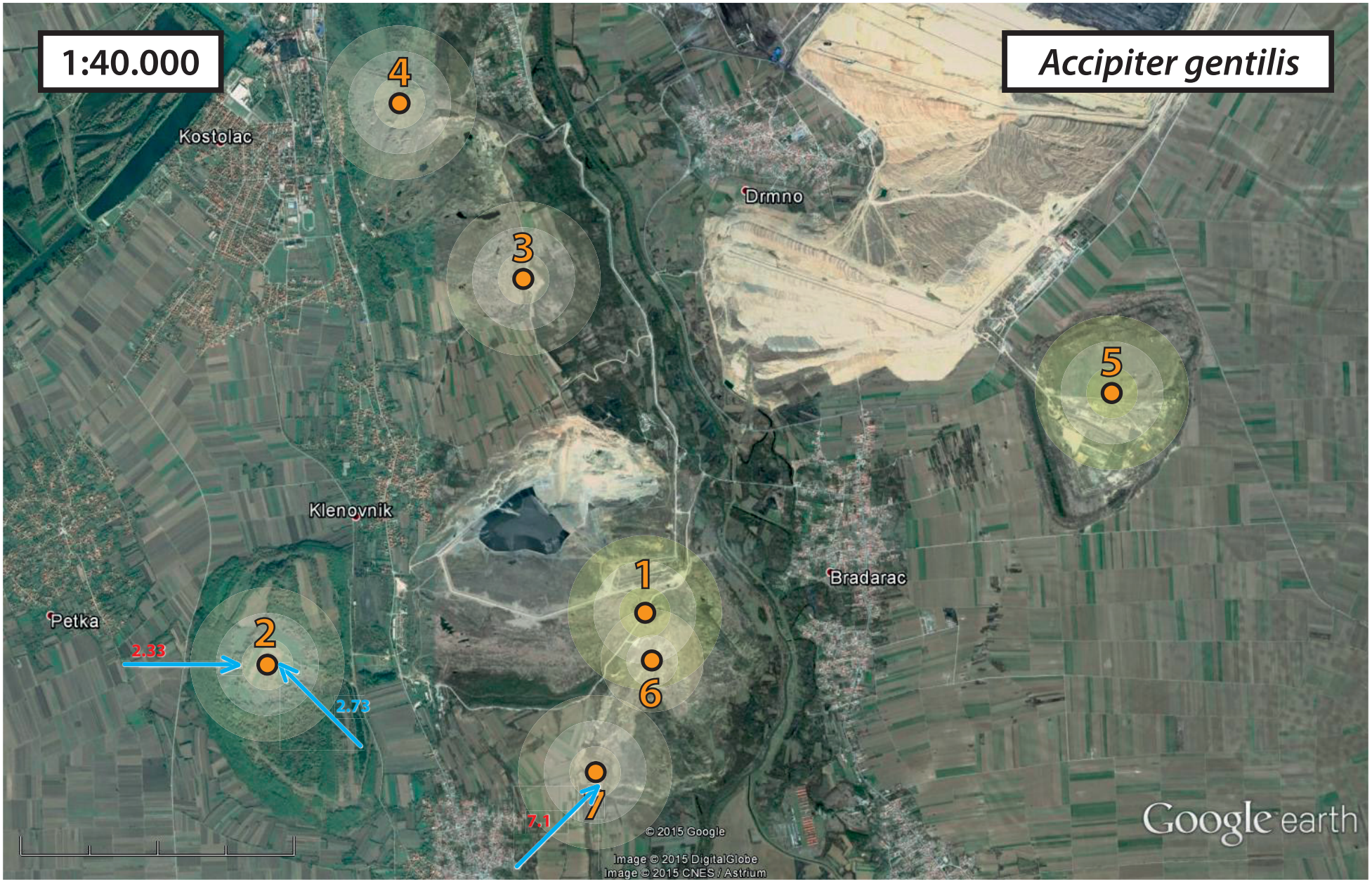
1:40.000
Accipiter gentilis
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
2
3
4
5
6
7
2.33
2.73
7.1
© 2015 Google
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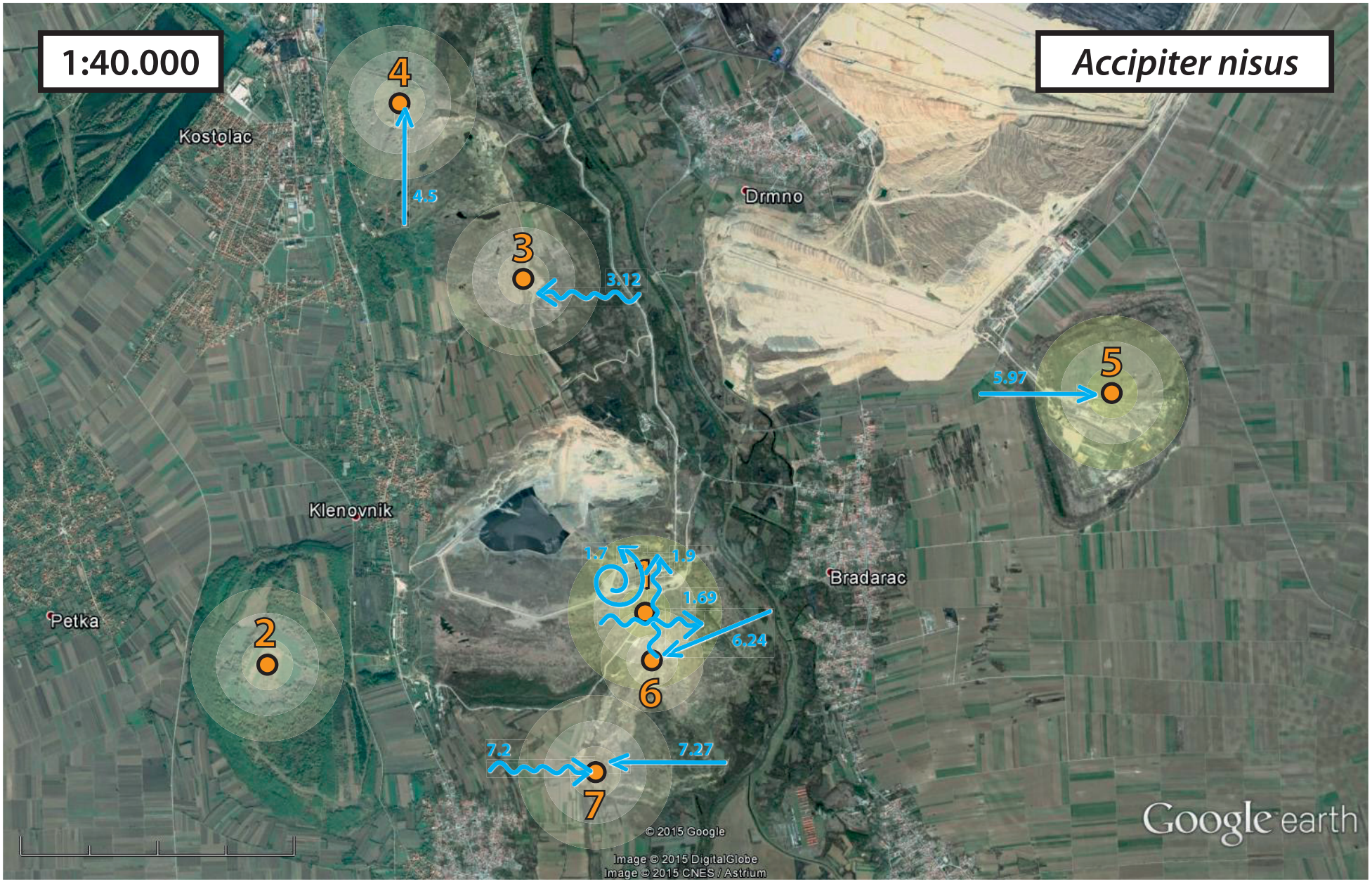
Image © 2015 CNES / Astrium
Google earth


1:40.000
Accipiter nisus
Kostolac
Drmno
Klenovnik
Bradarac
Petka
4
4.5
3
3.12
5
5.97
2
1
1.7
1.9
1.69
6.24
6
7.2
7.27
7
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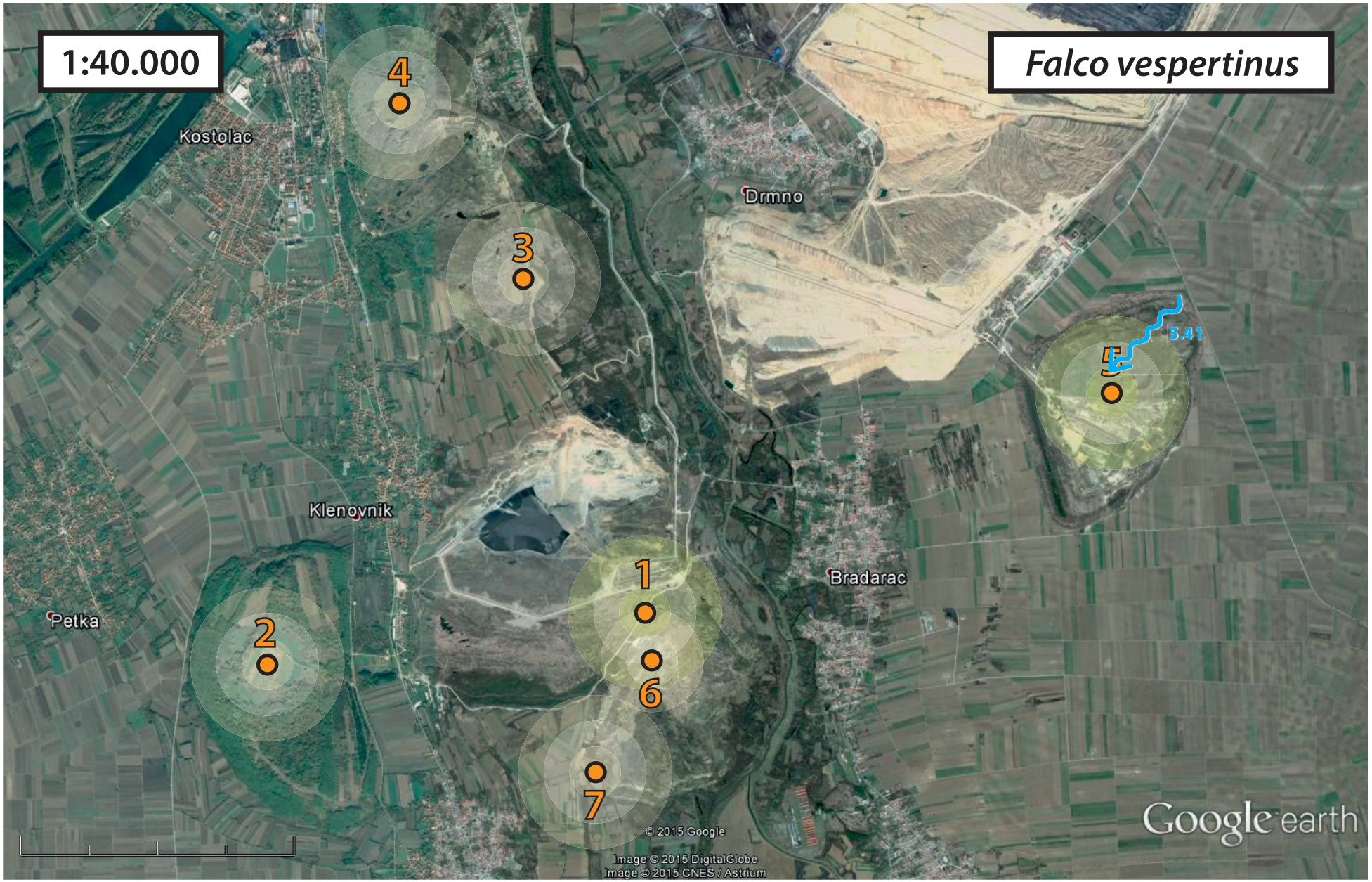
Google earth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Falco vespertinus
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
2
3
4
5
6
7
5.41
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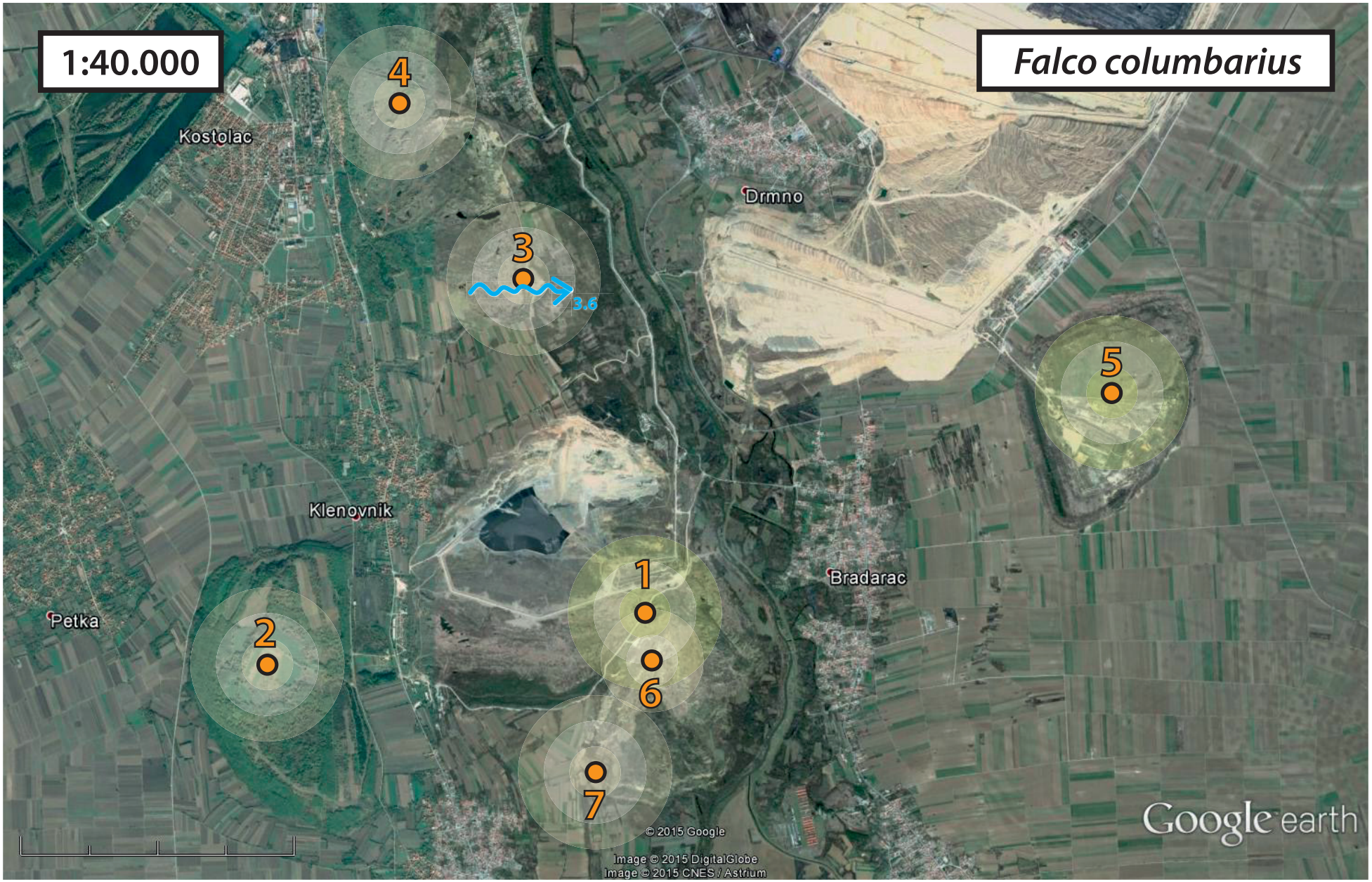
Google earth


1:40.000
Falco columbarius
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
2
3
3.6
4
5
6
7
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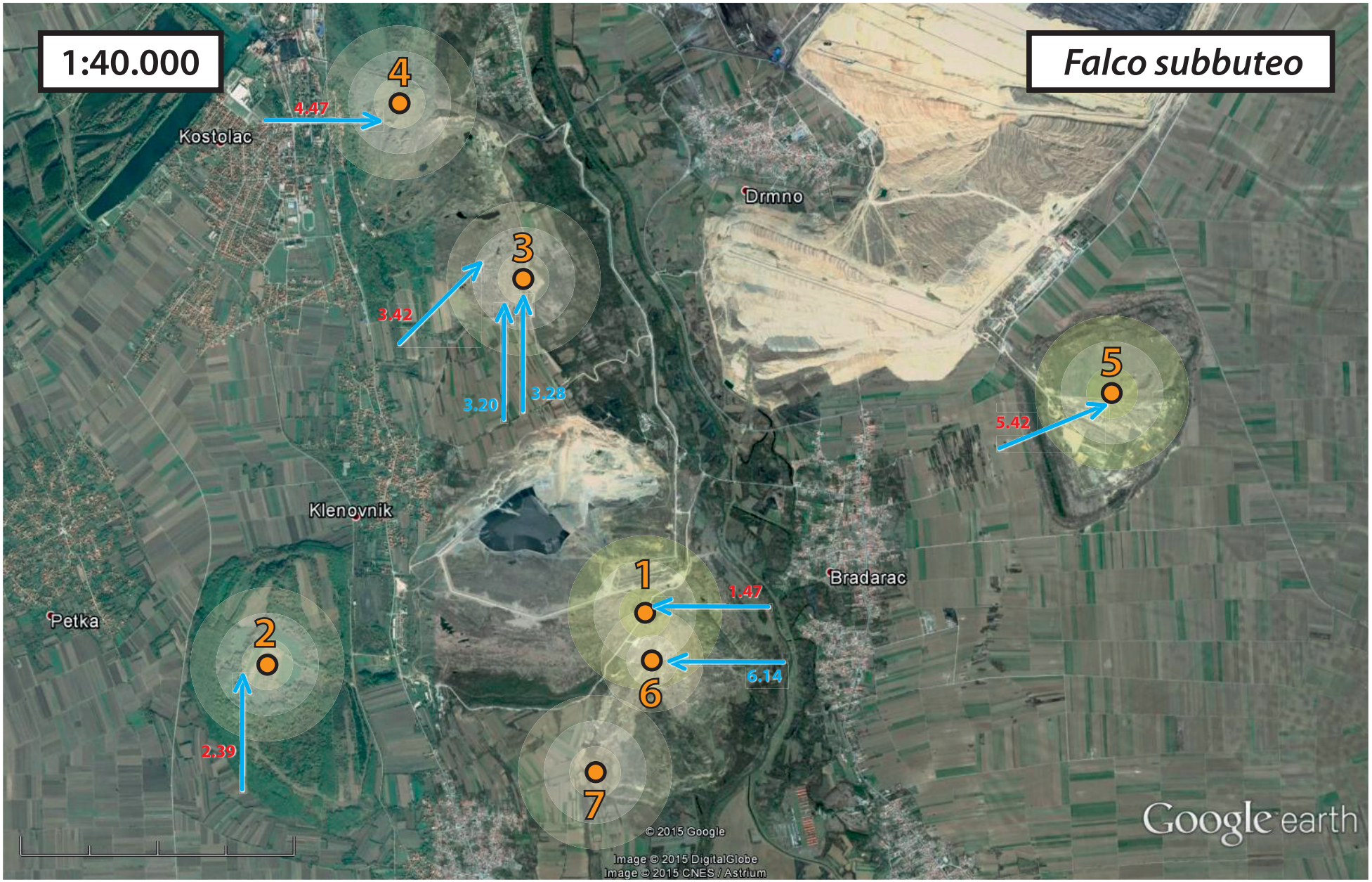
Google earth


1:40.000
Falco subbuteo
4
4.47
Kostolac
Drmno
3
3.42
3.20
3.28
5
5.42
Klenovnik
1
1.47
Bradarac
Petka
2
6
6.14
2.39
7
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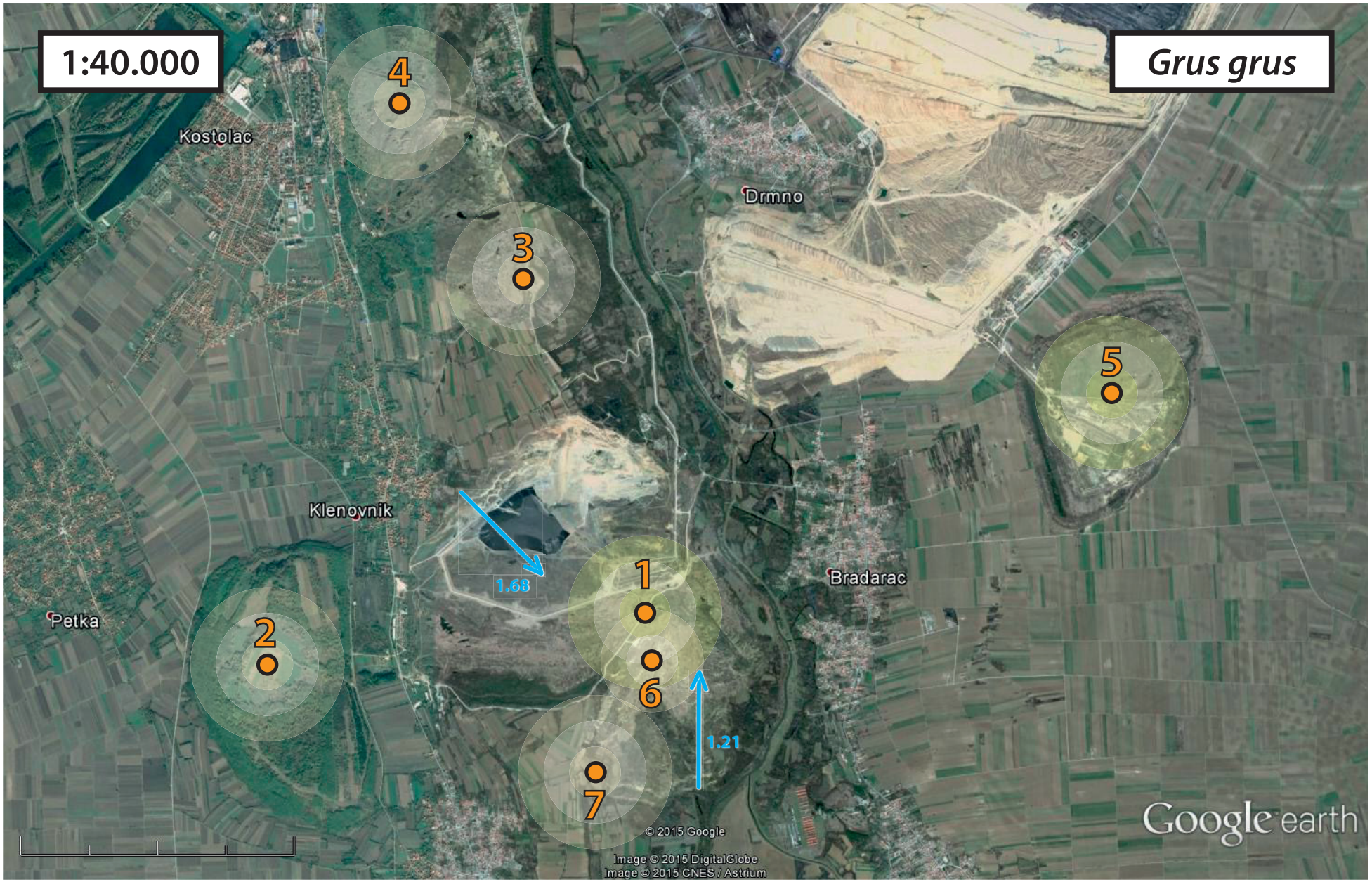
1:40.000
Grus grus
Kostolac
Drmno
Klenovnik
Bradarac
Petka
1
2
3
4
5
6
7
1.68
1.21
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DOCUMENTATION

(Conditions of Relevant Institutions and Decision Establishing the Need for Drafting and determining the scope and content of the Environmental impact assessment study of project of construction of wind farm on the locality of Kostolac (Decision No: 353-02-01621 / 2016-16 of September 13)

ЈАВНО ПРЕДУЗЕЋЕ „ЕЛЕКТРОПРИВРЕДА С
ПРИМЉЕНО: 23 -09- 2016
Орг. јед. | Број | Прилог
1200 | 1201 | 353/1 | 58

Република Србија
МИНИСТАРСТВО ПОЉОПРИВРЕДЕ
И ЗАШТИТЕ ЖИВОТНЕ СРЕДИНЕ
Број: 353-02-01621/2016-16
Датум: 13.09.2016.

На основу чл. 14. и 32. Закона о процени утицаја на животну средину («Сл. гласник РС», 135/04 и 36/09), чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07), чл. 192. став 1. Закона о општем управном поступку („Сл. лист СРЈ“, 33/97, 31/01 и „Сл. гласник РС“, 30/10), члана 5. и члана 37. став 5. Закона о министарствима („Сл. гласник Р С“, 44/2014), члана 23. став 2.и члана 24. став 2. Закона о државној управи ("Сл. гласник РС", 79/2005, 101/2007, 95/2010 и 99/2014), поступајући по захтеву носиоца пројекта, ЈП ЕЛЕКТРОПРИВРЕДА СРБИЈЕ, из Београда, Царице Милице 2, Министарство пољопривреде и заштите животне средине доноси

Р Е Ш Е Њ Е

1. ОДРЕЂУЈЕ се обим и садржај Студије о процени утицаја на животну средину Пројекта изградње парка ветроелектрана на локалитету Костолца на: КП 429, 452/1, 468, 475, 522, 547 и 612 КО Брадарац, КП 2896, 2482/1, 1433 и 1417 КО Кленовник, КП 1550 и 1551 КО Ћириковац и КП 2604 и 1640/1 КО Костолац-село, територија Града Пожаревца, од укупно 20 ветроагрегата снаге 3,3 MW и укупне инсталисане снаге 66 MW, предвиђен Просторним планом подручја посебне намене Костолачког угљеног басена („Сл. гласник РС“, 1/2013).
2. Обавеза носиоца пројекта је да Студију изради у свему према чл. 17. Закона о процени утицаја на животну средину („Сл. гласник РС“, 135/04 и 36/09) и чл. 1-10 Правилника о садржини студије о процени утицаја на животну средину («Сл. гласник РС» 69/05) и обавезама које проистичу из Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07).
3. Нетехнички краћи приказ података наведених у студији израдити као посебан сепарат студије који садржи кључне изводе и податке из свих поглавља студије, написане једноставним нетехничким језиком, са мерама заштите животне средине и програмом праћења утицаја на животну средину, који се наводе у интегралном тексту из студије.
4. Уз студију о процени утицаја приложити копије услова и сагласности других надлежних органа и организација издатих у складу са посебним законом.
5. Носилац пројекта дужан је да, у року од годину дана од дана коначности овог решења, поднесе захтев за давање сагласности на студију о процени утицаја пројекта на животну средину из тачке 1. овог решења.

О б р а з л о ж е њ е

Носилац пројекта ЈП ЕЛЕКТРОПРИВРЕДА СРБИЈЕ из Београда, Царице Милице 2, обратио се овом органу захтевом бр. 353-02-01621/2016-16 од 08.08.2016. године, за одређивање обима и садржаја Студије о процени утицаја на животну средину Пројекта изградње парка ветроелектрана на локалитету Костолца на: КП 429, 452/1, 468, 475, 522, 547 и 612 КО Брадарац, КП 2896, 2482/1, 1433 и 1417 КО Кленовник, КП 1550 и 1551 КО Ћириковац и КП 2604 и 1640/1 КО Костолац-село, територија Града Пожаревца, од укупно 20 ветроагрегата снаге 3,3 MW и укупне инсталисане снаге 66 MW, предвиђен Просторним планом подручја посебне намене Костолачког угљеног басена („Сл. гласник РС“, 1/2013).

Уз захтев и упитнике достављени су:

- Информација о локацији бр. 350-01-04615/2016-14 од 02.08.2016. коју је издало Министарство грађевинарства, саобраћаја и инфраструктуре;
- Графички прилог макро и микролокације ветроелектране Костолац;
- Решење Завода за заштиту природе Србије бр. 03 020-2775/2 од 29.12.2014.
- Решење о условима за израду пројектне документације за изградњу ветропарка Костолац бр. 399/2 -2014 од 16.12.2014. које је издао Регионални завод за заштиту споменика културе из Смедерева;
- Услови за израду техничке документације бр 14207/1 од 08.12.2014. које је дало ЈП СРБИЈАШУМЕ;
- Услови за израду техничке документације бр 06-03/22517 од 22.01.2015. које је дало ЈП СРБИЈАГАС;
- Услови ТЕЛЕКОМ СРБИЈА АД бр. 382821/2-2014 од 02.02.2014.;
- Извод из идејног пројекта изградње парка ветроелектрана на локалитету Костолца са ситуационим планом планираних зона изградње, који је израдио НЕТИНВЕСТ PR/EPS-VPK/16 из Београда, Теразије 12/V;
- Мониторинг птица и слепих мишева за потребе пројекта изградње ветроелектране Костолац који је израдио FAUNA C&M из Нових Бановаца, Земунска 19;
- Информација о предложеним активностима изградње 20 ветроагрегата са пратећим елементима за експлоатацију на локалитету Костолац, у складу са чл. 32. Закона о процени утицаја на животну средину («Службени гласник РС», број 135/04 и 36/09) и чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07) на српском и енглеском језику;

Поступајући по предметном захтеву овај орган је, обавестио заинтересоване органе, организације и јавност, организовао јавни увид и обезбедио доступност података из захтева и документације носиоца пројекта, путем штампаних медија (оглас у листу “Данас” од 15.08.2016.) и преко сајта Министарства, сходно одредбама члана 14., а у вези са чланом 29. Закона о процени утицаја на животну средину.

Коментаре су у законском року је доставила НВО Центар за екологију и одрживи развој (ЦЕКОР) из Суботице, Корзо 15/13.

Примедбе се односе на: могућност кумулативног ефекта са ефектима других пројеката у вези са изворима буке, рекултивацијом подручја захваћеног рударством и пратећим индустријским активностима, миграционе руте птица (мрежа НАТУРА 2000), као и утицај саобраћајница које повезују насеља у локалу.

Планирани пројекат предвиђа изградњу комплекса ветроелектране Костолац на просторима спољних одлагалишта и јаловишта у Костолцу, настала као последица рударских активности. Комплекс се састоји од следећих функционалних подцелина:

- Ветроагрегата који представљају генераторске јединице и састоје се од ротора, гондоле, торња и темеља, напонског нивоа 690 kV/35 kV;
- Унутрашње кабловске мреже (подземни кабловски водови напонског нивоа 35k V;
- Трафо станице 35 kV/110 kV са командном и управном зградом преко које се ветроелектрана прикључује на преносни систем ради пласмана произведене електричне енергије и одакле се управља радом електране;
- Приступних путева, који се може поклапати са са трасом унутрашње кабловске мреже делимично, или у потпуности;

Ветроелектрана се састоји од инфраструктурних објеката за производњу електричне енергије, објеката за пренос енергије, приступних саобраћајница и простире се на захвату од 60 km^2, тако да се заузима површина од 20 m^2 испод сваког ветроагрегата (тачкаста примена), док темељна стопа која је укопана има радијус до 25 метара. Предвиђено је позиционирање 20 ветроагрегата појединачне снаге 3,3 MW, тако да је укупна инсталисана снага 66 MW.

Сагласно чл. 32. Закона о процени утицаја на животну средину («Сл. гласник РС», број 135/04 и 36/09) и чл. 3. Конвенције о процени утицаја на животну средину у прекограничном контексту („Сл. гласник РС“ 102/07), попуњени обрасци на српском и енглеском језику постављени су на сајт Министарства и у електронској форми прослеђени Републици Румунији, због потенцијалног прекограничног утицаја пројекта на животну средину.

Уредбом Владе Србије утврђена је Листа пројеката за које је обавезна процена утицаја и Листе пројеката за које се може захтевати процена утицаја на животну средину („Сл. гласник РС“ 114/08), при чему се предметни пројекат –уређаји за коришћење снаге ветра у циљу производње електричне енергије (фарме ветрењача) може се сврстати у тачку 3. подтачка 3) – Производња енергије, Листе пројеката за које се може захтевати процена утицаја на животну средину.

Неповољни утицаји ветроелектрана на животно окружење представљају ризици на увећање морталитета птица и слепих мишева, повећање буке током рада, као и на доминантни визуелни аспект подручја. Такође, екстремни хаваријски акциденти могу да доведу до делимичног загађења земљишта.

У складу са тим, а на основу члана 14. и члана 17. Закона о процени утицаја на животну средину («Службени гласник РС», број 135/04 и 36/09), као и на основу члана 1. и чланова 2. до 10. Правилника о садржини студије о процени утицаја на животну средину («Службени гласник РС», број 69/05), утврђен је обим и садржај предметне студије.

У вези са изложеним, утврђена је обавеза носиоца пројекта да, у року од годину дана од дана коначности овог решења, поднесе захтев за давање сагласности на студију о процени утицаја пројекта на животну средину из тачке 1. овог решења.

Плаћена је републичка административна такса у износу од 1 920,00,00 динара у складу са Законом о републичким административним таксама („Сл. гласник РС“ 47/13 и 57/2014), тарифни број 186.

ПОУКА О ПРАВНОМ ЛЕКУ: Против овог решења може се уложити жалба Влади Републике Србије путем овог органа у року од 15 дана од дана пријема решења, односно од дана обавештавања заинтересоване јавности о донетом решењу.

Помоћник министра
По решењу о овлашћењу
бр. 021-01-43/2016-01 од 17.08.2016.

Александар Весић

Доставити:
-наслову
-архиви

Чувати до 2023. године
Функција 34 ред. бр. 42
Датум: 31.07.2018. год.
Обрађивач: вс М.Пајагић

РЕПУБЛИКА СРБИЈА
МИНИСТАРСТВО ОДБРАНЕ
СЕКТОР ЗА МАТЕРИЈАЛНЕ РЕСУРСЕ
УПРАВА ЗА ИНФРАСТРУКТУРУ

Број 4764-4

31.07.2018. године
Б Е О Г Р А Д

Обавештење у вези са израдом техничке документације за изградњу ветроелектране у Костолцу, доставља.

МИНИСТАРСТВО ГРАЂЕВИНАРСТВА,
САОБРАЋАЈА И ИНФРАСТРУКТУРЕ

Веза: Захтев Министарства грађевинарства, саобраћаја и инфраструктуре број 350-02-00280/2018-14, под ROP-MSGI-19614-LOC-1/2018.

На основу вашег захтева за инвеститора ЈП „Електропривреда Србије“ из Београда, у складу са тачком 2. и 6. Одлуке о врстама инвестиционих објеката и просторних и урбанистичких планова од значаја за одбрану ("Службени гласник РС", број 85/15), обавештавамо вас да за израду техничке документације за изградњу ветроелектране инсталисане снаге 66MW у Костолцу, на катастарским парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца, нема посебних услова и захтева за прилагођавање потребама одбране земље.

Инвеститор је у обавези да у процесу изградње примени све нормативе, критеријуме и стандарде у складу са Законом о планирању и изградњи ("Сл. гласник РС", бр. 72/2009, 81/2009 - испр., 64/2010 - одлука УС, 24/2011, 121/2012, 42/2013 - одлука УС, 50/2013 – одлука УС, 98/2013 - одлука УС, 132/2014 и 145/2014), као и другим подзаконским актима која регулишу предметну материју.

МП

СЛОБОДАН СТАРЧЕВИЋ 2012975770031-2012975770031

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DN: c=RS, cn=СЛОБОДАН СТАРЧЕВИЋ 2012975770031-2012975770031
Date: 2018.07.31 09:32:26 +02'00'

НАЧЕЛНИК
потпуковник
Слободан Старчевић

Израђено у 1 (једном) примерку и достављено:
— Министарству грађевинарства, саобраћаја и инфраструктуре, (ЦЕОП системом) и
— а/а (актом).

СРБИЈАГАС

Сектор за развој

Јавно предузеће
"СРБИЈАГАС"
Нови Сад
Број 07-07/16959
25. 07. 2018 год

Република Србија
МИНИСТАРСТВО ГРАЂЕВИНАРСТВА, САОБРАЋАЈА И ИНФРАСТРУКТУРЕ

Ваш број: ROP-MSGI -19614-LOC-1/2018

Наш број: OP217/18 (667/18)

Датум: 24.07.2018.г.

Предмет: Услови за израду техничке документације и одобрење са условима за извођење радова у заштитном појасу гасовода, у циљу издавања локацијских услова за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на к.п. у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца

Поштовани,

Поводом Вашег ROP-MSGI-19614-LOC-/2018 захтева за издавање услова за израду техничке документације и одобрења са условима за извођење радова у заштитном појасу гасовода, у циљу издавања локацијских услова за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на к.п. у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца обавештавамо Вас да је у обухвату планираних радова, у надлежности ЈП "Србијагас":

- изграђена дистрибутивна гасоводна мрежа од челичних цеви максималног радног притиска (МОР) 16 bar, пречника Ø 168,3 mm и Ø 88,9 mm,
- изграђена дистрибутивна гасоводна мрежа од полиетиленских цеви МОР 4 bar,

што је приказано на ситуацији приложеној уз овај допис.

Трасе гасовода дате у прилогу су информативног карактера и за израду документације и извођење радова користити званичне и ажурне податке о висинском и ситуационом положају изведених инсталација ЈП "Србијагас" из надлежног катастра подземних водова. Због могућег одступања података из катастра подземних водова од стања на терену, при извођењу радова неопходно је извршити пробне ископе ("шлицовања") ради утврђивања тачног положаја гасовода.

При изради пројектно – техничке документације и изградњи потребно је поштовати сва прописана растојања од гасних инсталација у складу са:

- Правилником о условима за несметану и безбедну дистрибуцију природног гаса гасоводима притиска до 16 bar ("Сл. гласник РС", бр. 086/2015),
- и Техничким условима за изградњу у заштитном појасу гасоводних објеката (датим у наставку текста).

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Технички услови за изградњу у заштитном појасу гасоводних објеката:

1. Дистрибутивни гасовод од челичних цеви МОР 16 bar

Изградња нових објеката не сме угрозити стабилност, безбедност и поуздан рад гасовода.

Минимално растојање темеља објеката од гасовода од је 3 m.

При планирању саобраћајница и уређењу терена потребно је поштовати прописане висине надслоја у односу на укопан гасовод у зависности од услова вођења (у зеленој површини, испод коловоза и сл.).

Минимална висина надслоја у односу на укопан гасовод у зеленој површини је 0,8 m.

Минимална висина надслоја у односу на укопан гасовод у тротоару (рачунајући од горње ивице цеви до горње коте тротоара) је 1,0 m.

Приликом укрштања гасовода са саобраћајницама, пругама и далеководима назívног напона преко 35 kV, оса гасовода је по правилу под правим углом у односу на осу саобраћајнице. Уколико то није могуће извести дозвољена су одступања до угла од 60°.

Приликом укрштања гасовода са саобраћајницама минимална висина надслоја од горње ивице гасовода до горње коте коловозне конструкције, без примене посебне механичке заштите, ако се статичким прорачуном цевовода на саобраћајно оптерећење утврди да је то могуће, износи 1,35 m.

Приликом укрштања гасовода са саобраћајницама минимална висина надслоја од горње ивице гасовода до горње коте коловозне конструкције када се гасовод механички штити полагањем у заштитну цев, износи 1,0 m, ако се статичким прорачуном цевовода на саобраћајно оптерећење утврди да је то могуће.

Полагање гасовода дуж саобраћајница се врши без примене посебне механичке заштите ако се статичким прорачуном цевовода на саобраћајно оптерећење утврди да је то могуће, с тим да минимална дубина укопавања од горње ивице гасовода до горње коте коловозне конструкције пута у том случају износи 1,35 m, а све у складу са условима управљача пута.

Приликом укрштања гасовода са железничком пругом минимална висина надслоја од горње ивице гасовода до горње ивице прага железничке пруге износи 1,5 m.

Минимална дозвољена растојања спољне ивице подземних челичних гасовода 10 bar <МОР≤ 16 bar и челичних и ПЕ гасовода 4 bar < МОР ≤ 10 bar са другим гасоводима, инфраструктурним и другим објектима су:

	Минимално дозвољено растојање (m)	
	Укрштање	Паралелно вођење
Од гасовода до нисконапонских и високонапонских ел.каблова	0,30	0,60
Од гасовода до шахтова и канала.	0,20	0,30

Није дозвољено паралелно вођење подземних водова изнад и испод гасовода.

Није дозвољено постављање шахта изнад гасовода.

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2. Дистрибутивни гасовод од полиетиленских цеви МОР 4 bar

Изградња нових објеката не сме угрозити стабилност, безбедност и поуздан рад гасовода.

Минимално растојање темеља објеката од гасовода од је 1 m.

При планирању саобраћајница и уређењу терена потребно је поштовати прописане висине надслоја у односу на укопан гасовод у зависности од услова вођења (у зеленој површини, испод коловоза и сл.).

Минимална висина надслоја у односу на укопан гасовод у зеленој површини је 0,8 m.

Минимална висина надслоја у односу на укопан гасовод у тротоару (рачунајући од горње ивице цеви до горње коте тротоара) је 1,0 m.

Приликом укрштања гасовода са саобраћајницама, пругама и далеководима назívног напона преко 35 kV, оса гасовода је по правилу под правим углом у односу на осу саобраћајнице. Уколико то није могуће извести дозвољена су одступања до угла од 60°.

Приликом укрштања гасовода са саобраћајницама минимална висина надслоја од горње ивице гасовода до горње коте коловозне конструкције, без примене посебне механичке заштите, ако се статичким прорачуном цевовода на саобраћајно оптерећење утврди да је то могуће, износи 1,35 m.

Приликом укрштања гасовода са саобраћајницама минимална висина надслоја од горње ивице гасовода до горње коте коловозне конструкције када се гасовод механички штити полагањем у заштитну цев, износи 1,0 m, ако се статичким прорачуном цевовода на саобраћајно оптерећење утврди да је то могуће.

Полагање гасовода дуж саобраћајница се врши без примене посебне механичке заштите ако се статичким прорачуном цевовода на саобраћајно оптерећење утврди да је то могуће, с тим да минимална дубина укопавања од горње ивице гасовода до горње коте коловозне конструкције пута у том случају износи 1,35 m, а све у складу са условима управљача пута.

Приликом укрштања гасовода са железничком пругом минимална висина надслоја од горње ивице гасовода до горње ивице прага железничке пруге износи 1,5 m.

Минимална дозвољена растојања спољне ивице подземних челичних и ПЕ гасовода МОР ≤ 4 bar са другим гасоводима, инфраструктурним и другим објектима су:

	Минимално дозвољено растојање (m)	
	Укрштање	Паралелно вођење
Од гасовода до нисконапонских и високонапонских ел.каблова	0,20	0,40
Од гасовода до шахтова и канала.	0,20	0,30

Није дозвољено паралелно вођење подземних водова изнад и испод гасовода.

Није дозвољено постављање шахта изнад гасовода.

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3. Минимална хоризонтална растојања подземних челичних гасовода МОР 16 bar и полиетиленских гасовода МОР 4 bar од надземне електро мреже и стубова далековода су:

	Минимално растојање	
Називни напон	при укрштању (m)	при паралелном вођењу (m)
1 kV ≥ U	1	1
1 kV < U ≤ 20 kV	2	2
20 kV < U ≤ 35 kV	5	10
35 kV < U	10	15

Минимално хоризонтално растојање се рачуна од темеља стуба далековода.

4. Посебне мере заштите изграђених гасовода при извођењу радова:

1. У појасу ширине по 3 m са сваке стране, рачунајући од осе дистрибутивног гасовода МОР 16 и 4 bar, на местима укрштања и паралелног вођења, предвидети извођење свих земљаних радова ручним ископом. На растојању 1 m до 3 m ближе ивице рова од спољне ивице гасовода, могуће је предвидети машински ископ у случају кад се пробним ископима ("шлицовањем") недвосмислено утврди тачан положај гасовода и кад машински ископ одобри представник ЈП "Србијагас" на терену.
2. Уколико на местима укрштања и/или паралелног вођења дође до откопавања гасоводне цеви, оштећена изолациона трака (односи се гасоводе од челичних цеви) се мора заменити новом. Замену обавезно изводе радници ЈП "Србијагас" о трошку инвеститора, а по достављању благовременог обавештења.
3. Уколико на местима укрштања и/или паралелног вођења дође до откопавања гасоводне цеви и оштећења гасовода о овоме се хитно мора обавестити ЈП "Србијагас" ради предузимања потребних мера које ће се одредити након увида у стање на терену.
4. У случају оштећења гасовода, које настане услед извођења радова у зони гасовода, услед непридржавања утврђених услова, као и услед непредвиђених радова који се могу јавити приликом извођења објекта, инвеститор је обавезан да сноси све трошкове санације на гасоводним инсталацијама и надокнади штету насталу услед евентуалног прекида дистрибуције гаса.
5. Приликом извођења радова грађевинска механизација мора прелазити трасу гасовода на обезбеђеним прелазима урађеним тако да се не изазива појачано механичко напрезање гасовода.
6. Употреба вибрационих алата у близини гасовода је дозвољена уколико не утиче на механичка својства и стабилност гасовода.
7. У зони 5 m лево и десно од осе гасовода не дозвовољава се надвишење (насипање постојећег терена), скидање хумуса, односно промена апсолутне коте терена која је постојала пре извођења радова.
8. Приликом извођења радова у зонама опасности и код ослобођене гасоводне цеви потребно је применити све мере за спречавање изазивања експлозије или пожара: забрањено је радити са отвореним пламеном, радити са алатом или уређајима који могу при употреби изазвати варницу, коришћење возила који при раду могу изазвати варницу, коришћење електричних уређаја који нису у складу са нормативима прописаним у одговарајућим стандардима SRPS за противексплозивну заштиту, одлагање запаљивих материја и држање материја које су подложне самозапаљењу.
9. Инвеститор је обавезан, у складу са Законом о цевоводном транспорту гасовитих и течних угљоводоника и дистрибуцији гасовитих угљоводоника (Сл. гласник РС, бр.

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4/2009), да 10 дана пре почетка радова у заштитном појасу гасовода, обавести ЈП "Србијагас" у писаној форми, како би се обезбедило присуство нашег представника за време трајања радова у близини гасовода.

Контрола спровођења мера из ових услова врши се о трошку Инвеститора.

Рок важности овог документа је годину дана од дана издавања.

Прилог: као у тексту

С поштовањем,

СЕКТОР ЗА РАЗВОЈ
ДИРЕКТОР

Владимир Ликић, дипл.инж.маш.

Копије:

- Сектору за развој
- Архиви

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NORTH

KOSTOLAC-GRAD

OSTROVO

DRMNO

KLENOVNIK

BRADARAC

MRS Petka

PETKA

fi 168,3

IRIKOVAC

MRS Crikovac

MALJUREVAC

fi 88,9

MRS Maljurevac

BUBUSINAC

POŽAREVAC-GRAD

BARE

MRS Bratinac

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СРБИЈАГАС
НОВИ САД

ЈАВНО ПРЕДУЗЕЋЕ СРБИЈАГАС
ОРГАНИЗАЦИОНИ ДЕО БЕОГРАД

Legenda

Distributivni gasovod od celicnih cevi MOP 16 bar

Distributivni gasovod od polietilenskih cevi MOP 4 bar

Merno regulaciona stanica

Granica katastarske opstine

OBRADA: Snezana Dobrikovic
DATUM: 23.07.2018.g.

RAZMERA 1:20000

Р е п у б л и к а С р б и ј а
ЗАВОД ЗА ЗАШТИТУ ПРИРОДЕ СРБИЈЕ
Нови Београд, Др Ивана Рибара бр. 91
Тел: +381 11/2093-802; 2093-803
Факс: + 381 11/2093-867

Завод за заштиту природе Србије, Београд, Ул. Др Ивана Рибара бр. 91 (овл.сл.лице Горан Дрмановић, Одлука 04 бр. 035-784/1 од 29.03.2017. године), на основу чл. 9. Закона о заштити природе („Службени гласник РС“, бр. 36/2009, 88/2010, 91/2010–исправка и 14/2016) и члана 136. Закона о општем управном поступку („Службени гласник РС“, бр. 18/2016), поступајући по захтеву предузећа ЈП „Електропривреда Србије“, Балканска 13, Београд, за издавање услова заштите природе у поступку издавања локацијских услова за изградњу ветроелектране у Костолцу, на територији града Пожаревца, дана 30.07.2018. године под 03 бр. 020-1945/2, доноси

Р Е Ш Е Њ Е

1. Предметно подручје ветроелектране у Костолцу се не налази унутар заштићеног подручја за које је спроведен или покренут поступак заштите, не налази се у просторном обухвату еколошке мреже нити у простору евидентираних природних добара. Налази се у непосредној близини реке Дунав, еколошког коридора од међународног значаја, као и подручја од националног и међународног значаја за птице (IBA „Лабудово окно“ RS016IBA) у оквиру еколошке мреже Републике Србије. Сходно томе, издају се услови заштите природе:

1) Дозвољава се постављање укупно 20 ветроагрегата висине осе ротора 117 m односно укупне висине са елисом у вертикалном положају 180 m, као и пратећих објеката трафостанице 110/35 kV, управне зграде ветропарка, три релејне кућице и пратеће инсталације на катастарским парцелама бр. 410, 411, 481, 3352 429, 475, 468, 612, 547, 522, 407, 408, 409, 418, 419 и 923, 452/1, 962, 448, 447, 446, 445, 444, 443, 959, 465, 466, 467, 469, 470, 471, 472, 473, 474, 957, 484, 483, 482, 917, 428, 922, 539, 538, 953, 540, 951, 611, 541, 542, 543, 544, 545, 546, 548, 549, 550, 525, 524, 523, 931, 1122, 1611, 1613, 3340, 3131, 3132, 3338, 3004, 2965, 3353, 3349, 2519, 3359/2, 613 и 417 у К.О. Брадарац, кп. бр. 1550 и 1551/1 у К.О. Ћириковац, 2482/2, 2896, 1433 и 1417, 2908, 2482/1, 2907, 2261, 2262, 2260, 2263, 2258, 2257, 2256, 1431,1430, 1432, 1434, 1425 и 1424. у К.О. Кленовник и к.п. бр. 460, 2650/1, 1640/1 и 2686 у К.О. Костолац село, на територији града Пожаревца;
2) Приликом изградње објеката неопходно је користити постојећу путну мрежу и избећи уништавање необрађених површина, вегетације уз пољопривредне површине и остатке природних или полуприродних станишта на ширем подручју;
3) Уколико је неопходна изградња додатних приступних саобраћајница, ове радове тако организовати да се не угрози стабилност терена или изазову процеси ерозије;
4) У зони непосредно уз ветроагрегате и безбедоносној зони у полупречнику r=200 m уклонити сву коровску и жбунасту вегетацију и исту косити на висини око 20 cm од подлоге, нарочито у зони око стубова ветроагрегата;
5) Веће или мање водене површине адекватно дренирати како не би дошло до насељавања инсеката који могу да привуку птице и слепе мишеве;
6) У циљу заштите миграторних врста, електране на ветар изнад 50 MW инсталисане снаге треба да буду опремљене тако да обезбеде континуално

праћење прелаза птица и слепих мишева изнад територије коју заузима електрана на ветар;

7) Није дозвољено обављати било какве интервенције у зонама са великом концентрацијом врста и јединки птица и слепих мишева, а нарочито у зонама њихових склоништа, ноћилишта и гнездилишта.
8) Након пуштања ветропарка у рад потребно је обезбедити редовно праћење - евидентирање страдања птица и остале фауне. Резултате овог праћења неопходно је редовно, на годишњем нивоу, достављати Заводу за заштиту природе Србије. Извештај би требало да садржи фотографије страдалих птица и слепих мишева, тачне локације и време налажења, удаљеност од ветрогенератора и временске услове;
9) Ниво буке контролисати и мерити у постконструктивном периоду у циљу одржавања нивоа буке у дозвољеним границама;
10) У складу са резултатима постконструктивног праћења предвидети могућност ограничавања/успоравања ветрогенератора уколико се укаже потреба;
11) Уколико дође до квара ветрогенератора који проузрокују већи ниво буке, неопходно је обуставити рад и квар санирати у најкраћем могућем периоду;
12) Рад ветрогенератора обуставити и у случају већег страдања птица или других врста животиња, обавестити Завод и приступити утврђивању разлога страдања како би се утврдиле даље мере заштите;
13) Уколико се примети да се птице и слепи мишеви у већем броју и редовно задржавају на појединим локацијама у непосредној близини ветрогенератора, односно да су привучене одређеним објектима (различити стубови, дрвеће, дивље депоније и сл.), неопходно је, уз претходне консултације са Заводом, или уклонити дате објекте, или применити техничке мере како би се спречило задржавање и окупљање птица и слепих мишева;
14) Применити мере заштите који ће минимизирати утицај ветропарка и пратећих објеката на птице:
    - уколико након изградње ветропарка и пратећих објеката дође до гнежђења птица на истим, предвидети постављање платформи за њихово гнежђење, уз сарадњу са Заводом за заштиту природе Србије.
    - у циљу праћења утицаја ветропарка и пратећих објеката на птице у постконструктивном периоду, приликом коришћења објекта, интервенисати у случају гнежђења птица на далеководу на основу посебних услова заштите природе;
15) Угинуле животиње, пре свега сисаре и птице, након евидентирања за потребе извештавања о страдању, неопходно је редовно уклањати са подручја ветропарка;
16) Због близине еколошког коридора Дунава, при изградњи ветрогенератора је неопходно примењивати техничко-технолошке мере при чему се пре свега мисли на осветљавање објеката, како би се избегли негативни утицаји оваквих објеката;
17) Уколико се ветрогенератори обележавају светлосном сигнализацијом она мора бити трепћућа;
18) Осветљење пратећих објеката мора бити сведено на минимум и мора бити усмерено ка тлу;
19) Земљиште око бетонских темеља стубова и земљиште на коме се постављају каблови је неопходно санирати након завршетка радова и вратити у претходно стање, а обезбедити на тај начин да се онемогући укопавање и прављење склоништа од стране сисара који воде подземни начин живота, а који су плен грабљивицама;

20) Све инсталације морају бити уземљене, обезбеђене и одговарајуће изоловане како би се спречило, односно свело на најмању могућу меру страдање дивљих врста;
21) Пратећи објекти трафостаница 110/35 kV, управна зграда ветропарка, три релејне кућице и пратеће инсталације, морају бити тако конструисани да онемогуће насељавање птица и слепих мишева;
22) Након окончања радова на изградњи обавезна је комплетна санација свих деградираних површина, искључујући озелењавање у зони ветроагергата и приступних путева од ветроагрегата;
23) Забрањено је одлагање комуналног и грађевинског отпада и свих других облика органског отпада на подручју ветропарка;
24) Депонију вишкова земље која је настала приликом грађевинских радова обезбедити од спирања и разношења и најкасније након окончања радова, евакуисати са локације и депоновати на место и под условима надлежне комуналне службе;
25) У случају напуштања предметне локације, односно престанка рада ветропарка, инвеститор је обавезан да, што је пре могуће, евакуише инсталирану опрему, уклони све објекте и у целини санира локацију и доведе је у стање блиско првобитном;
26) Уколико се током радова наиђе на геолошко-палеонтолошке или минералошко-петролошке објекте, за које се претпоставља да имају својство природног добра, извођач је дужан да у року од осам дана обавести Министарство заштите животне средине, односно предузме све мере како се природно добро не би оштетило до доласка овлашћеног лица.

2. Ово решење не ослобађа подносиоца захтева да прибави и друге услове, дозволе и сагласности предвиђене позитивним прописима.

3. За све друге радове/активности на предметном подручју или промене пројектне документације, потребно је поднети нови захтев.

4. Уколико подносилац захтева у року од две године од дана достављања овог решења не отпочне радове и активности за које је ово решење издато, дужан је да поднесе захтев за издавање новог решења.

6. Такса за издавање овог Решења у износу од 70.000,00 динара је одређена у складу са чланом 2. став 4. тачка 2. алинеја 3. Правилника о висини и начину обрачуна и наплате таксе за издавање акта о условима заштите природе („Службени гласник РС“, бр. 73/2011, 106/2013).

О б р а з л о ж е њ е

Надлежни орган - Министарство грађевинарства, саобраћаја и инфраструктуре доставило је Заводу за заштиту природе Србије захтев бр. ROP-MSGI-19614-LOC-1/2018 дана 20.07.2018. године, заводни бр. 350-02-00280/2018-14 од 12.07.2018. године, у Заводу заведен под бр. 020-1945/1 дана 20.07.2018. године, за издавање услова заштите природе за израду локацијских услова за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на катастарским парцелама у К.О. Брадарац, К.О. Ћириковац, К.О. Кленовник и К.О. Костолац село, на територији града Пожаревца, подносиоца захтева ЈП „Електропривреда Србије“, ул. Балканска 13, Београд.

На основу достављеног захтева и пратеће документације, утврђено је да је планирана локација за изградњу ветропарка у Костолцу позиционирана на катастарским парцелама датим у тачки 1. овог решења, укупне инсталисане снаге 66 MW са укупно 20 макролокација односно 20 ветроагрегата. Поред 20 ветроагрегата планирана је и изградња пратећих објеката у виду трафостанице 110/35 kV, управне зграде ветропарка, три релејне кућице и пратећих инсталација.

Увидом у Централни регистар заштићених природних добара и документацију Завода, а у складу са прописима који регулишу област заштите природе, утврђени су услови заштите природе из диспозитива овог решења. Предметно подручје се не налази унутар заштићеног подручја за које је спроведен или покренут поступак заштите, не налази се у просторном обухвату еколошке мреже нити у простору евидентираних природних добара. Међутим, налази се у непосредној близини реке Дунав, еколошког коридора од међународног значаја према Уредби о еколошкој мрежи.

Законски основ за доношење решења:
Закон о заштити природе („Службени гласник РС“, бр. 36/2009, 88/2010, 91/2010-исправка и 14/2016); Уредба о еколошкој мрежи („Службени гласник РС“, бр. 102/2010); Правилник о проглашењу и заштити строго заштићених и заштићених дивљих врста биљака, животиња и гљива („Службени гласник РС“, бр. 5/2010, 47/2011, 32/2016 и 98/2016); Правилник о специјалним техничко-технолошким решењима која омогућавају несметану и сигурну комуникацију дивљих животиња („Службени гласник РС“, бр. 72/2010).

Планирани пројекат/активност може се реализовати под условима дефинисаним овим решењем, јер је процењено да неће значајније утицати на непосредну околину подручја у Костолцу.

На основу свега наведеног, одлучено је као у диспозитиву овог решења.

Упутство о правном средству: Против овог решења може се изјавити жалба Министарству заштите животне средине у року од 15 дана од дана пријема решења. Жалба се предаје писмено или изјављује усмено на записник Заводу за заштиту природе Србије, уз доказ о уплати Републичке административне таксе у износу од 460,00 динара на текући рачун бр. 840-742221843-57, позив на број 59013 по моделу 97.

НАЧЕЛНИК ОДЕЉЕЊА
Горан Дрмановић, маст.правник

Goran Drmanović
340855-2203971710522
Digitally signed by Goran Drmanović
340855-2203971710522
Date: 2018.07.30 15:49:43 +02'00'

по Одлуци директора
04 бр. 035-784/1 од 29.03.2017. године

ЈАВНО ПРЕДУЗЕЋЕ ПУТЕВИ СРБИЈЕ	**Услови за пројектовање**	Број: 953-16240 Датум: 25-07-2018

Београд, Булевар краља Александра 282
www.putevi-srbije.rs

МИНИСТАРСТВО ГРАЂЕВИНАРСТВА,САОБРАЋАЈА И ИНФРАСТРУКТУРЕ

Београд, ул. Немањина бр.22-26

На основу Вашег захтева број: **ROP-MSGI-19614-LOC-1/2018 од 12.07.2018.године**, базираном на захтеву предузећа „ ЈП Електропривреда Србије “, Београд, ул. Балканска13, за издавање локацијских услова за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на катастарским парцелама у КО Брадарац, КО Ћирковац, КО Кленовник и КО Костолац село, општина Пожаревац, достављеног кроз **Систем обједињене процедуре** електронским путем (бр.**ROP-MSGI-19614-LOC-1-HPAP-5/2018** од **20.07.2018.године)** а у складу са Законом о планирању и изградњи („Сл.гласник“, бр. 72/2009, 81/2009 - испр., 64/2010 - одлука УС, 24/2011, 121/2012, 42/2013 – одлука УС, 50/2013 –одлука УС, 98/2013 – одлука УС, 132/2014 и 145/2014), Правилника о поступку спровођења обједињене процедуре електронским путем ("Сл.гласник РС", бр.113/15, 96/16,120/17), Уредбом о локацијским условима (“Сл. гласник РС” бр. 35/15, 114/15, 117/17) и Законом о јавним путевима („Сл. гласник РС“, бр. 41/18), имаоца јавних овлашћења ЈП ”Путеви Србије” на основу достављене документације из прилога кроз систем за електронско подношење пријава, као и друге расположиве документације, констатује следеће:

Објекат који је предмет захтева је Категорије: Г, класификациони број: 230201 – објекти ветроагрегата, 221420-трансформаторске станице и подстанице, 221411-међумесни надземни или подземни водови за дистрибуцију електричне енергије високог или средњег напона, 221412-стубови далековода

Катастарска општина:КО Брадарац, КО Ћирковац, КО Кленовник и КО Костолац село, Општина Пожаревац

Обухваћене катастарске парцеле бр.: наведене кроз систем обједињене процедуре

Плански документи:

-Просторним планом подручја посебне намене костолачког угљеног басена (“Сл.гласник РС” 1/2013),

-Измене и допуне просторног плана подручја посебне намене костолачког угљеног басена (“Сл.гласник РС” 20/2018).

Достављена документација кроз систем електронским путем:

- *Идејно решење за инвеститора „ЈП Електропривреда Србије“, из Београда, ул. Балканска13.*
- *Остала документација достављена-приложена кроз систем обједињене процедуре.*

На основу увида у приложену документацију и документацију којом располаже ЈП „Путеви Србије“, а ради издавања услова за пројектовање, обавештавмо вас предмет ових локацијских услова није у нашој надлежности.

У Идејном решењу ветроелектране инсталисане снаге 66 MW у Костолцу-Свеска1-Идејно нрешење архитектуре, дато је:

„Приступне саобраћајнице ветроагрегатима као и прикључци приступних саобраћајница на државне и општинске путеве нису обухваћене овим идејним решењем и биће предмет другог Идејног решења и засебних локацијских услова. У изводу из планског документа приказано је њихово концепцијско решење које ће детаљније бити разрађено засебном инвестиционо-техничком документацијом.“

Контакт: Лидија Зец дипл.грађ.инж. тел: 011 30 40 662

Доставити:

- ЈППС Сектор за стратегију,пројектовање и развој
- Архиви.

ИЗВРШНИ ДИРЕКТОР
СЕКТОРА ЗА СТРАТЕГИЈУ, ПРОЈЕКТОВАЊЕ И РАЗВОЈ

Биљана Вуксановић, дипл.грађ.инж.

РЕПУБЛИКА СРБИЈА
МИНИСТАРСТВО ГРАЂЕВИНАРСТВА,
САОБРАЋАЈА И ИНФРАСТРУКТУРЕ
Немањина 22-26

Број: 130-00-UTD-003-684/2018-003
Датум: 27.07.2018. године

Бр. предмета у комуникацији подносиоца захтева и НО: ROP-MSGI-19614-LOC-1/2018
Бр. предмета у комуникацији НО и ИЈО: ROP-MSGI-19614-LOC-1-HPAP-17/2018

Предмет: **Издавање локацијских услова за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу, на катастарским парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца**

На основу вашег захтева број 350-02-00280/2018-14 од 20.07.2018. године, који је код нас заведен дана 23.07.2018. године под бројем ДТЕХ-31483, и достављене документације (Идејно решење, Копија плана за катастарску парцелу, Извод из катастра водова и ситуациони план у дигиталном облику), обавештавамо вас о следећем:

1. Трасе далековода:

   1.1. 400 kV бр. 401/1 ТС Београд 8 - РП Дрмно,
   1.2. 400 kV бр. 401/2 РП Дрмно - РП Ђердап 1,
   1.3. 110 kV бр. 1159 РП Дрмно - ТЕ Костолац А и
   1.4. 110 kV бр. 1196/1 ТС Рудник 1 - ТС Рудник 3,

   који су у власништву „Електромрежа Србије" А.Д, налазе се у непосредној близини комплекса ветроелектране Костолац и трансформаторске станице 110/35 kV Дрмно и укрштају се или паралелно воде са трасом унутрашње кабловске мреже 35 kV.

2. Планом развоја преносног система Републике Србије за период од 2018. до 2027. године, предвиђа се прикључење ВЕ Костолац као „улаз-излаз" на далековод 110 kV бр.1128/1 ТЕ Костолац А – ТС Рудник 1, који је у власништву Електропривреде Србије.

С обзиром на горе поменуте околности обавештавамо вас да је свака градња испод или у близини далековода условљена:

„Законом о енергетици" („Сл. гласник РС", бр. 145/2014),
„Законом о планирању и изградњи" („Сл. гласник РС", бр. 72/2009, 81/2009 - испр., 64/2010 - одлука УС, 24/2011, 121/2012, 42/2013 - одлука УС, 50/2013 - одлука УС и 98/2013 - одлука УС, 132/2014 и 145/2014),
„Правилником о техничким нормативима за изградњу надземних електроенергетских водова називног напона од 1 kV до 400 kV" („Сл. лист СФРЈ" број 65 из 1988. год.; „Сл. лист СРЈ" број 18 из 1992. год.),
„Правилником о техничким нормативима за електроенергетска постројења називног напона изнад 1000 V" („Сл. лист СФРЈ" број 4/74),

„Правилником о техничким нормативима за уземљења електроенергетских постројења називног напона изнад 1000 V" („Сл. лист СРЈ" број 61/95),
„Законом о заштити од нејонизујућих зрачења" („Сл. гласник РС" број 36/2009) са припадајућим правилницима, од којих посебно издвајамо: „Правилник о границама нејонизујућим зрачењима" („Сл. гласник РС", бр. 104/2009) и „Правилник о изворима нејонизујућих зрачења од посебног интереса, врстама извора, начину и периоду њиховог испитивања" („Сл. гласник РС", бр. 104/2009),
„SRPS N.C0.105 Техничким условима заштите подземних металних цевовода од утицаја електроенергетских постројења" („Сл. лист СФРЈ" број 68/86),
„SRPS N.C0.101 - Заштитом телекомуникационих постројења од утицаја електроенергетских постројења - Заштита од опасности",
„SRPS N.C0.102 - Заштитом телекомуникационих постројења од утицаја електроенергетских постројења - Заштита од сметњи" („Сл. лист СФРЈ" број 68/86), као и
„SRPS N.C0.104 – Заштита телекомуникационих постројења од утицаја електроенергетских постројења – Увођење телекомуникационих водова у електроенергетска постројења" („Сл. лист СФРЈ" број 49/83).

У складу са међународним стандардом EN50341-3-4 и осталим међународним правилницима и усвојеним праксама треба водити рачуна о следећем:

- Да минимално потребно растојање између хоризонталне пројекције најближег фазног проводника далековода у неотклоњеном стању, као и било ког дела прикључно-разводног постројења, од осе најближег ветрогенератора износи $H_{oserotora}$+D/2+10m, где је D пречник елисе ротора.
- Да би претходни услов био применљив потребно је све фазне проводнике и заштитну ужад на свим далеководима на адекватан начин заштитити од еолских утицаја и вибрација проузрокованих радом будућих ветрогенератора. Овакав вид заштите је потребно да се предвиди у било ком затезном пољу постојећих и планираних далековода на коме је минимално потребно растојање између хоризонталне пројекције најближег фазног проводника у неотклоњеном стању и хоризонталне пројекције најближе тачке ротора (у раду) планираног ветрогенератора, мање од 3xD, где је D пречник елисе ротора.

У случају градње испод или у близини далековода, потребна је сагласност „Електромрежа Србије" А.Д., при чему важе следећи услови:

- Сагласност би се дала на Елаборат који Инвеститор планираних објеката треба да обезбеди, у коме је дат тачан однос далековода и објеката чија је изградња планирана, уз задовољење горе поменутих прописа и закона и исти може израдити пројектна организација која је овлашћена за те послове. Трошкови израде Елабората падају у целости на терет Инвеститора планираних објеката.
- Приликом израде Елабората прорачуне сигурносних висина и удаљености урадити за температуру проводника од +80°C, у складу са техничким упутством ТУ-ДВ-04. За израду Елабората користити податке из пројектне документације далековода које вам на захтев достављамо, као и податке добијене на терену геодетским снимањем који се обављају о трошку Инвеститора планираних објеката.
- Елаборат доставити у минимално три примерка (два примерка остају у трајном власништву „Електромрежа Србије" А.Д.), као и у дигиталној форми.
- У Елаборату приказати евентуалне радове који су потребни да би се међусобни однос ускладио са прописима.

Претходно наведени услови важе приликом израде:

1) Елабората о могућностима градње планираних објеката у заштитном појасу далековода. Заштитни појас далековода износи 25 m са обе стране далековода напонског нивоа 110 kV од крајњег фазног проводника и 30 m са обе стране далековода напонског нивоа 400 kV од крајњег фазног проводника.
   Напомена: У случају да се планира постављање стубова јавне расвете у заштитном појасу далековода, потребно је исте уважити при изради Елабората.
2) Елабората заштите проводника од еолских утицаја и вибрација проузрокованих радом ветрогенератора.
3) Елабората утицаја далековода на потенцијално планиране објекте од електропроводног материјала.
   Овај утицај, у зависности од насељености подручја, потребно је анализирати на максималној удаљености до 1000 m од осе далековода.
4) Елабората утицаја далековода на телекомуникационе водове (овај Елаборат није потребно разматрати у случају да се користе оптички каблови).
   Овај утицај, у зависности од специфичне отпорности тла и насељености подручја, потребно је анализирати на максималној удаљености до 3000 m од осе далековода у случају градње телекомуникационих водова.

У случају да се из Елабората утврди колизија далековода и комплекса ветроелектране Костолац са пратећом инфраструктуром и уколико се утврди јавни (општи) интерес планираног објекта и достави налог мера за измештање (реконструкцију или адаптацију) од стране надлежних органа, потребно је да се:

- Приступи склапању Уговора о пословно-техничкој сарадњи ради регулисања међусобних права и обавеза између „Електромрежа Србије" А.Д. и свих релевантних правних субјеката у реализацији пројекта адаптације или реконструкције далековода, у складу са „Законом о енергетици" („Сл. гласник РС", бр. 145/2014) и „Законом о планирању и изградњи" („Сл. гласник РС" број 72/2009, 81/2009-исправка, 64/2010-одлука УС, 24/2011, 121/2012, 42/2013-одлука УС и 50/2013-одлука УС, 98/2013-одлука УС, 132/2014 и 145/2014).
- О трошку Инвеститора планираних објеката, а на бази пројектих задатака усвојених на Стручном панелу за пројектно техничку документацију „Електромрежа Србије" А.Д., уради техничка документација за адаптацију или реконструкцију и достави „Електромрежа Србије" А.Д. на сагласност.
- О трошку Инвеститора планираних објеката, евентуална адаптација или реконструкција далековода (односно отклањање свих колизија констатованих Елаборатом) изврши пре почетка било каквих радова на планираним објектима у непосредној близини далековода.

Наша препорука је да се било који објекат, планира ван заштитног појаса далековода како би се избегла израда Елабората о могућностима градње планираних објеката у заштитном појасу далековода и евентуална адаптација или реконструкција далековода. Такође, наша препорука је и да минимално растојање планираног објекта, пратеће инфраструктуре и инсталација, од било ког дела стуба далековода буде 12 m, што не искључује потребу за Елаборатом.

Остали општи технички услови:

- Приликом извођења радова као и касније приликом експлоатације планираних објеката, водити рачуна да се не наруши сигурносна удаљеност од 5 m у односу на проводнике далековода напонског нивоа 110 kV, односно 7 m у односу на проводнике далековода напонског нивоа 400 kV.
- Испод и у близини далековода не садити високо дрвеће које се својим растом може приближити на мање од 5 m у односу на проводнике далековода напонског нивоа 110 kV, односно на мање од 7 m у односу на проводнике далековода напонског нивоа 400 kV, као и у случају пада дрвета.
- Забрањено је складиштење лако запаљивог материјала у заштитном појасу далековода.
- Нисконапонске и друге прикључке извести подземно у случају укрштања са далеководом.
- Најистуренији делови цевовода кроз које се испушта флуид морају бити удаљени најмање 30 m од најистуренијих делова далековода који су под напоном.s
- Приликом извођења било каквих грађевинских радова, нивелације терена, земљаних радова и ископа у близини далековода, ни на који начин се не сме угрозити статичка стабилност стубова далековода. Терен испод далековода се не сме насипати.
- Све металне инсталације (електро-инсталације, грејање и сл.) и други метални делови (ограде и сл.) морају да буду прописно уземљени. Нарочито водити рачуна о изједначењу потенцијала.
- Пре почетка било каквих радова у близини далековода о томе обавестити представнике „Електромрежа Србије" А.Д.

Уобичајена је пракса да се у постојећим коридорима далековода и постојећим трансформаторским станицама (разводним постројењима) могу изводити санације, адаптације и реконструкције, ако то у будућности због потреба интервенција и ревитализација електроенергетског система буде неопходно, а не може бити сагледано у овом часу.

Важност предметних услова је две године од датума издавања или краће уколико дође до промене законских регулатива и прописа. Након истека овог рока подносилац захтева је дужан да тражи обнову важности истих.

Обавештавамо вас да сходно члану 29. Уредбе о локацијским условима (*„Сл. гласник РС", бр. 35/2015)*, за објекте који су у функцији производње, преноса и дистрибуције електричне енергије, као и за друге објекте за које грађевинску дозволу издаје министарство надлежно за послове грађевинарства, односно надлежни орган аутономне покрајине, услове за пројектовање и прикључење у погледу прикључења на дистрибутивни, односно преносни систем електричне енергије, не прибавља надлежни орган, већ произвођач у складу са законом којим се уређује енергетика. Чланом 118 Закона о енергетици, дерфинисана су права и обавезе ЈП „Електромрежа Србије" као оператора преносног система и произвођача који жели да изгради прикључак, а иста се у овом случају уређују уговорима:

- Уговором о изради Студије прикључења Објекта на преносни систем;
- Уговором о изради планске и техничке документације и прибављању потребних дозвола за градњу Прикључка;
- Уговором о праћењу градње Прикључка.

Напомињемо да смо техничке услове број 331-00-UTD-044-1/2018/001, за израду техничке документације у поступку прибављања локацијске дозволе за изградњу ВЕ Костолац на преносни систем, издали дана 20.10.2015. године.

Информације о процесу прикључења на преносни систем „Електромрежа Србије" АД, можете добити од Руководиоца пројеката прикључења Веселина Копривице.

За сва додатна објашњења можете се обратити Сектору за високонапонске водове, Дирекција за техничку подршку преносном систему, Војводе Степе 412, 11000 Београд и Гордани Луковић на тел. 011/3957-223.

С поштовањем,

ИЛИЈА ЦВИЈЕТИЋ 2711963710225-2711963710225

Digitally signed by ИЛИЈА ЦВИЈЕТИЋ 2711963710225-2711963710225
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Date: 2018.07.27 13:19:50 +02'00'

Извршни директор за пренос електричне енергије

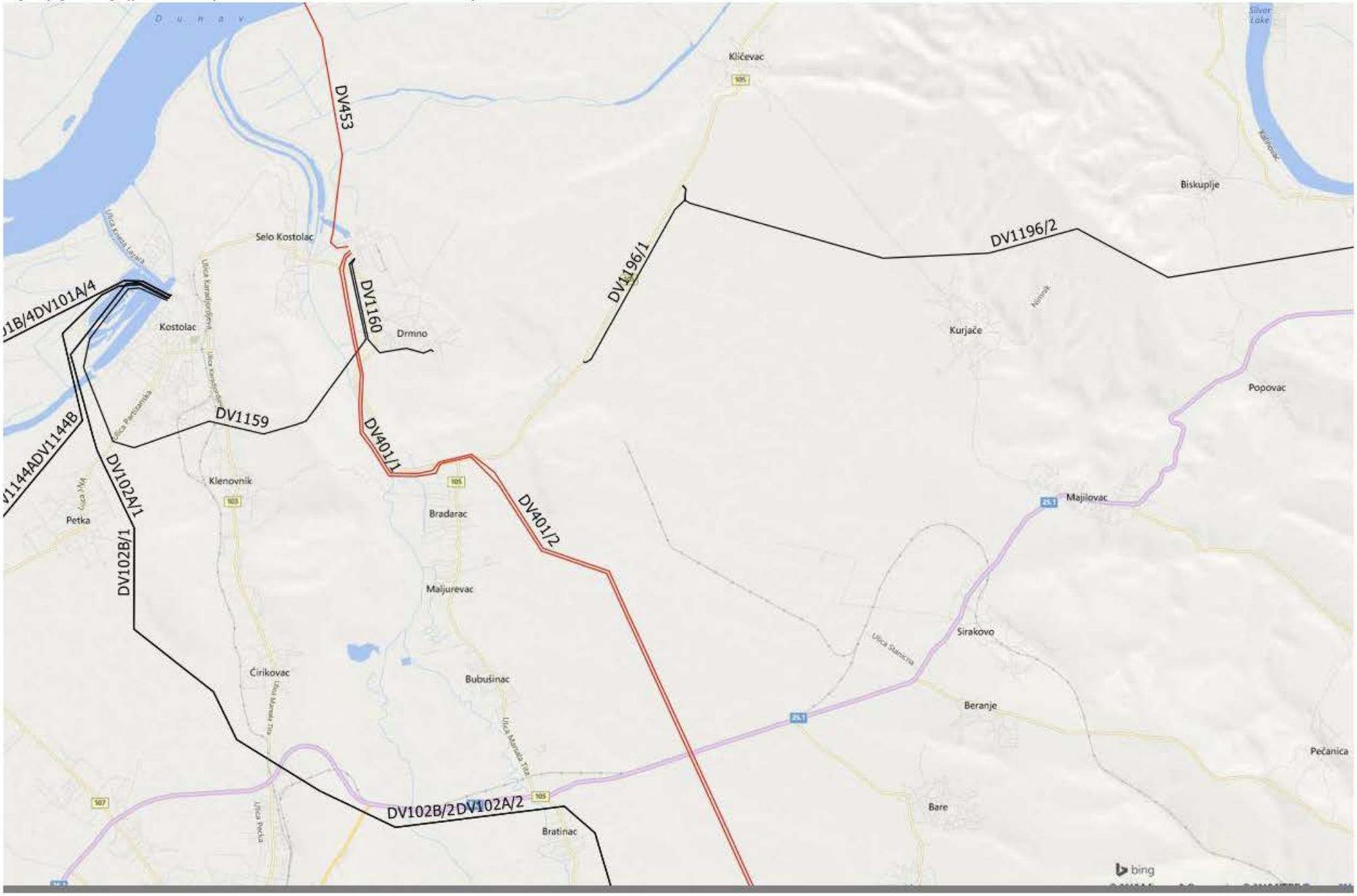
Илија Цвијетић, дипл. инж. електр.

Прилог:
- Ситуација са уцртаним трасама далековода од интереса

Копије доставити:
- Сектор за управљање стратешким и развојним пројектима
- Сектор за стратегију
- Центар за инвестиције
- Регионални центар одржавања Београд – ППС Београд
- Дирекција за техничку подршку преносном систему – Сектор за високонапонске водове

Други оригинал:
- Архива

Ситуација са уцртаним трасама далековода од интереса:



ОПЕРАТОР ДИСТРИБУТИВНОГ СИСТЕМА
„ЕПС ДИСТРИБУЦИЈА"
Бр. 8В000 - 209972/2
25-07-2018 20___.год
БЕОГРАД, МАСАРИКОВА 1-3

ЕПС ДИСТРИБУЦИЈА

ПР-ЕНГ-01.18/01

Наш број: 8V.1.0.0.-209972-18

Ваш број:

Пожаревац, 24.07.2018

ЈП,,Електропривреда,,Србије

БАЛКАНСКА бр. 13

0 БЕОГРАД-СТАРИ ГРАД

„ЕПС Дистрибуција" д.о.о. Београд, Огранак Електродистрибуција Пожаревац размотрио је захтев примљен дана 24.7.2018 године. На основу одредби члана 140. Закона о енергетици ("Сл. гласник РС" бр. 145/14), 8 и 8б Закона о планирању и изградњи ("Сл. гласник РС" бр. 72/09, 81/09, 64/10, 24/11, 121/12, 42/13, 50/13, 98/13, 132/14 и 145/14), Уредбе о локацијским усковима ("Сл. гласник РС" бр. 35/15,114/15), Уредбе о условима испоруке и снабдевања електричном енергијом ("Сл. гласник РС" бр. 63/13), Правила о раду дистрибутивног система ("Сл. гласник РС" бр. 71/17) и Одлуке о преносу овлашћења бр. 05.0.0.0.-08.01.-147302/1-17 од 07.06.2017, доносе се

УСЛОВИ ЗА УКРШТАЊЕ И ПАРАЛЕЛНО ВОЂЕЊЕ

за изградњу ВЕТРОЕЛЕКТРАНЕ КОСТОКЛАЦ (парцеле на К.О. КОСТОЛАЦ ,К.О.БРАДАРАЦ ,К.О ЋИРИКОВАЦ ,К.О.КЛЕНОВНИК.).

На датој локацији постоје електроенергетски објекти који се укрштају или паралелно воде са планираном трасом ВЕТРОЕЛЕКТРАНЕ КОСТОКЛАЦ (парцеле на К.О. КОСТОЛАЦ ,К.О.БРАДАРАЦ ,К.О ЋИРИКОВАЦ ,К.О.КЛЕНОВНИК.), а власништво су „ЕПС Дистрибуција" д.о.о. Београд, Огранак Електродистрибуција Пожаревац.

1. Инвеститор је у обавези да поштује следеће:

-На предметним локацијама постоје наше подземне инсталације 10kV и 0,4 kV напонског нивоа.Дубина наших инсталација је од 0,6 до 1,2 метара.
-Укрштање и паралено вођење урадити по важећим ТП ЕПС-а.
-На местима укрштања ископ вршити ручно.
-На предметним локацијама постоје наше трафо станице са припадајућим инсталацијама радног и заштитног уземљења, где је обавезан ручни ископ.
- На предметним локацијама постоје далеководи 10kV са припадајућим инсталацијама заштитног уземљења око стубова, где је обавезан ручни ископ.
-На предметним локацијама постоје и подземни кућни прикључци на нашу нисконапонску мрежу, који нису обухваћени овом сгласношћу.
-Извођач радова је у обавези да се благовремено обрати ЕД Електроморави Пожаревац пре почетка ископа, како би се инсталације обележиле на терену.

2. Додатни услови за извођење радова на изградњи објекта

2.1. Грађевинске радове у непосредној близини електроенергетских објеката вршити ручно,

без употребе механизације и уз предузимање свих потребних мера заштите.

2.2. Најкасније осам дана пре почетка било каквих радова у близини електроенергетских објеката инвеститор је у обавезни да се у писаној форми обрати Служби за припрему и надзор одржавања "ЕПС Дистрибуција" д.о.о. Београд, Огранак Електродистрибуција Пожаревац, Пожаревац, у коме ће навести датум и време почетка радова, одговорно лице за извођење радова и контакт телефон.

2.3. Обавезује се инвеститор да уколико приликом извођења радова наиђе на подземне електроенергетске објекте, одмах обавести Службу за припрему и надзор одржавања "ЕПС Дистрибуција" д.о.о. Београд, Огранак Електродистрибуција Пожаревац, Пожаревац.

2.4. У случају потребе за измештањем електроенергетских објеката морају се обезбедити алтернативне трасе и инфраструктурни коридори уз претходну сагласност „ЕПС Дистрибуција" д.о.о. Београд, Огранак Електродистрибуција Пожаревац. Трошкове постављања електроенергетског објекта на другу локацију, као и трошкове градње, у складу са чл.217. Закона о енергетици („Сл.гласник РС" бр. 145/14), сноси инвеститор објекта због чије изградње се врши измештање.

3. Ови Услови имају важност 12 месеци од дана издавања.

4. Уколико настану промене које се односе на ситуацију трасе-локације предметног објекта, инвеститор је у обавези да промене пријави и затражи издавање нових услова.

5. Услови за укрштање и паралелно вођење са овереним ситуацијама морају бити у садржају пројектне документације.

6. За неуважавање било којег од наведених услова инвеститор сноси пуну одговорност.

Прилог:

- Оверене ситуације x1

Шеф служ.МИЗ и аут.ДЕСС

ВладанТрифуновић,ел.инж.

ОПЕРАТОР ДИСТРИБУТИВНОГ СИСТЕМА * ЕПС ДИСТРИБУЦИЈА д.о.о. * БЕОГРАД 516

С поштовањем,

Достављено:

1. Наслову
2. Служби за енергетику
3. Служби за припрему и надзор одржавања
4. Писарници

Директор огранка

Никола Шљукић,дипл. инж.ел.

Телеком Србија
Предузеће за телекомуникације а.д.

ДЕЛОВОДНИ БРОЈ: 300914/2-2018
ДАТУМ:
ИНТЕРНИ БРОЈ:
БРОЈ ИЗ ЛКРМ: 39
ДИРЕКЦИЈА ЗА ТЕХНИКУ
Сектор за фиксну приступну мрежу
Служба за планирање и изградњу мреже Београд
Ул. Новопазарска бр. 37-39, 11000 Београд

Република Србија
МИНИСТАРСТВО ГРАЂЕВИНАРСТВА, САОБРАЋАЈА И ИНФРАСТРУКТУРЕ

Немањина 22-26
11000 Београд

ПРЕДМЕТ: Давање техничких услова за потребе издавања локацијских услова за изградњу ветроелектранеинсталисане снаге 66 MW У Костолцу на кат. парцелама у КО Брадарац, КО Ћириковац, КО Кленовнник и КО Костолац село, све на територији града Пожаревца.
ВЕЗА: Захтев бр. **350-02-00280/2018-14 od 12.07.2018.**
БРОЈ ПРЕДМЕТА: ROP-MSGI-19614-LOC-1/2018

Поступајући по вашем захтеву бр. 350-02-00280/2018-14 od 12.07.2018., дајемо Вам сагласност према приложеној нам ситуацији а под следећим условима:

1. Планираним радовима не сме доћи до угрожавања механичке стабилности и техничких карактеристика постојећих ТК објеката и каблова, ни до угрожавања нормалног функционисања ТК саобраћаја, и мора увек бити обезбеђен адекватан приступ постојећим кабловима ради њиховог редовног одржавања и евентуалних интервенција;
2. Пре почетка извођења радова потребно је, у сарадњи са надлежном службом „Телекома Србија" Извршна јединица Пожаревац, Служба за планирање, развој и инвестициону изградњу, ул.Јована Шербановића бр.3 12000 Пожаревац, извршити идентификацију и обележавање трасе постојећих подземних ТК каблова у зони планираних радова (помоћу инструмента трагача каблова и по потреби пробним ископима на траси), како би се утврдио њихов тачан положај и дубина и дефинисали коначни услови заштите ТК каблова;
3. Пројектант, односно извођач радова је у обавези да поштује важеће техничке прописе у вези са дозвољеним растојањима планираног објекта од постојећих ТК објеката и каблова;
4. **Заштиту и обезбеђење постојећих ТК објеката и каблова треба извршити пре почетка било каквих грађевинских радова** и предузети све потребне и одговарајуће мере предострожности како не би, на било који начин, дошло до угрожавања механичке стабилности, техничке исправности постојећих ТК објеката и каблова;
5. Грађевинске радове у непосредној близини постојећих ТК објеката и каблова вршити **искључиво ручним путем** без употребе механизације и уз предузимање свих потребних мера заштите (обезбеђење од слегања, пробни ископи и сл);
6. У случају евентуалног оштећења постојећих ТК објеката и каблова или прекида ТК саобраћаја услед извођења радова, извођач радова је дужан да предузећу „Телеком Србија" а.д. надокнади целокупну штету по свим основама (трошкове санације и накнаду губитка услед прекида ТК саобраћаја);
7. Уколико у току важења ових услова настану промене које се односе на ситуацију трасе – локацију предметног објекта, инвеститор/извођач радова је у обавези да промене пријави и затражи измену услова;
8. Ови **технички услови важе годину дана** од дана издавања. По истеку рока важности обавезно је подношење захтева за обнову техничких услова.
9. Уколико предметна изградња условљава измештање постојећих ТК објеката/каблова, неопходно је урадити **Техничко решење/Пројекат измештања, заштите и обезбеђења постојећих ТК објеката/каблова** у сарадњи са надлежном Службом „Телекома Србија". Такво техничко решење, мора бити **саставни део** потребне техничке документације.
   Извод из Пројекта за грађевинску дозволу који садржи поменуто Техничко решење са графичким прилогом и предмером и предрачуном материјала и радова, са издатим Техничким условима треба доставити обрађивачу услова, ради добијања сагласности.

Уколико се за предметне радове не ради главни пројекат, то не ослобађа инвеститора обавезе да изради Техничко решење/Пројекат измештања, заштите и обезбеђења постојећих ТК каблова и да на њега тражи сагласност.

10. Радови на заштити и обезбеђењу, односно радови на измештању постојећих ТК објеката/каблова, изводе се о трошку инвеститора, осим у случајевима када је ова област другачије дефинисана постојећим споразумом (Путеви Србије...). Обавеза инвеститора је и да регулише имовинско – правне односе и прибави потребне сагласности за будуће трасе ТК каблова, пре почетка радова на њиховом измештању.
11. Уколико се за предметне радове не ради Пројекат за грађевинску дозволу а изградња условљава измештање постојећих ТК објеката у обиму који излази из обухвата постојећих грађевинских употребних дозвола за ТК објекте, инвеститор је обавезан да уради Пројекат измештања ТК објеката са свим потребним сагласностима и условима за добијање употребне дозволе.
12. Измештање треба извршити на безбедну трасу, пре почетка радова на изградњи за коју се траже услови.
13. Приликом избора извођача радова на измештању постојећих ТК каблова водити рачуна да је извођач регистрован и лиценциран за ту врсту делатности и да буде са листе квалификованих извођача радова „Телекома Србија" а.д.
14. Обавеза инвеститора је да извођачу радова, поред остале техничке документације, достави и копију издатих услова (текст и ситуације) и Техничко решење измештања, заштите и обезбеђења постојећих ТК каблова угрожених изградњом, на које је „Телеком Србија" а.д. дао своју сагласност.За непоступање по наведеним условима инвеститор радова сноси пуну одговорност.
15. Инвеститор, односно извођач радова је у обавези да се најмање 10 (десет) дана пре почетка извођења радова на измештању, заштити и обезбеђењу постојећих ТК каблова, који се изводе пре грађевинских радова на изградњи предметног објекта, у писаној форми обратити „Телекому Србија" а.д, Извршној јединици Пожаревац у чијој надлежности је одржавање ТК објеката и каблова у зони планиране изградње, са обавештењем о датуму почетка радова и именима надзорног органа (контакт телефон) и руководиоца градилишта (контакт телефон).
16. „Телеком Србија" ће са своје стране одредити стручно лице ради вршења надзора над радовима на измештању, као и на заштити и обезбеђењу постојећих ТК каблова. Приликом извођења радова обавезно је присуство стручног надзора од стране Предузећа за телекомуникације "Телеком Србија" а.д.
17. По завршетку радова инвеститор/извођач радова је у обавези да у писаној форми обавестити предузеће „Телеком Србија" а.д. да су радови на изградњи овог објекта завршени, а у случају када је инвеститор урадио Пројекатизмештања ТК објеката из тачке 11, инвеститор је обавезан да предузећу Телеком Србија а.д. достави сву потребну документацију неопходну за добијање употребне дозволе.
18. По завршетку радова на измештању ТК објеката/каблова потребно је извршити контролу квалитета изведених радова. Инвеститор је дужан да уз захтев за формирање комисије за контролу квалитета, достави Пројекат изведеног објекта геодетски снимак и потврду Републичког геодетског завода о извршеном геодетском снимању и картирању водова, податке о представнику инвеститора и извођача радова који ће присуствовати раду комисије.
19. Инвеститор је у обавези да по завршетку радова на измештању ТК објеката/каблова изврши пренос новоизграђеног дела ТК капацитета, као основног средства на Предузеће за телекомуникације "Телеком Србија" а.д, како би у складу са законом могло да се спроводи њихово редовно одржавање.
    Информације на тел.012/ 532222 Стоимировић Зоран дипл.инж. Руководилац одељења за планирање и изградњу мреже Пожаревац

С поштовањем,

ШЕФ СЛУЖБЕ
Душан Прица, дипл.инж.

Dušan Prica 100065874-200396591006 5

Digitally signed by Dušan Prica 100065874-2003965910065
Date: 2018.07.23 14:51:31 +02'00'

Републички завод за заштиту споменика културе - Београд
Institute for the Protection of Cultural Monuments of Serbia - Belgrade

Радослава Грујића 11 Radoslava Grujića 11
11118 Београд 11118 Belgrade
Србија Serbia
Тел. (011) 24 54 786 Phone +381 11 24 54 786
Факс (011) 34 41 430 Fax +381 11 34 41 430
e-mail: office@heritage.gov.rs

Датум / Date: 23.07.2018.
Број / Ref. 1-1155/2018

МИНИСТАРСТВО ГРАЂЕВИНАРСТВА,
САОБРАЋАЈА И ИНФРАСТРУКТУРЕ

БЕОГРАД

Министарство грађевинарства, саобраћаја и инфраструктуре доставило је Републичком заводу за заштиту споменика културе – Београд захтев за утврђивање услова за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на кат.парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца.

Увидом у Централни регистар непокретних културних добара који води Републички завод за заштиту споменика културе – Београд утврђено је да на простору наведене деонице пруге нема непокретних културних добара од изузетног значаја.

С обзиром на наведено, а у складу са одредбама Закона о културним добрима („Службени гласник РС“, бр. 71/94, 52/11-и др.закон и 99/11-и др.закон), Републички завод за заштиту споменика културе – Београд није надлежан за утврђивање услова за предузимање мера техничке заштите за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на кат.парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца.

За директора по овлашћењу
0101 број 325/1 од 25.06.2014. године

Ивана Ранковић

Ivana Ranković 100045659-15 07959715077
Digitally signed by Ivana Ranković 100045659-15 07959715077
Date: 2018.07.23 10:19:18 +02'00'

ЈКП „Комуналне службе"

ПОЖАРЕВАЦ, ЈУГ БОГДАНОВА Бр. 22
Текући рачун: 160-12511-82
Шифра делатности: 3811
Матични број: 17223836
ПИБ: 100 436 152
Наш знак 01-3724/1
Ваш знак
Пожаревац 25.07.2018.

Република Србија
МИНИСТАРСТВО ГРАЂЕВИНАРСТВА,
САОБРАЋАЈА И ИНФРАСТРУКТУРЕ
Број предмета: ROP-MSGI-19614-LOC-1/2018
Београд, Немањина 22 – 26

На захтев Министарства грађевинарства, саобраћаја и инфраструктуре, а по предмету: ROP-MSGI-19614-LOC-1/2018, заведеног под бројем: 350-02-00280/2018-14, дана 12.07.2018. године, за потребе издавања локацијских услова у поступку обједињене процедуре електронским путем, а ради изградње ветроелектране инсталисане снаге 66MW у Костолцу на кат.парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца, инвеститора ЈП Електропривреда Србије, Балканска 13, Београд, те сходно члану 8. Уредбе о локацијским условима („Сл.гласник РС", број 35/15 и 114/15) и члану 11. Правилника о поступку спровођења обједињене процедуре електронским путем („Сл.гласник РС", број 113/15), као и на основу основу одлуке о Комуналном уређењу Града Пожаревца и Службеног Гласника Града Пожаревца Бр. 12/2010; 6/2011; 2/2012 и 3/2014 године и чланова 29,33,34,36,37,41,43, као и увидом у поднето идејно решење „P-IDE-R 1 ВЕТРОЕЛЕКТРАНЕ ИНСТАЛИСАНЕ СНАГЕ 66MW У КОСТОЛЦУ", ЈКП „Комуналне службе" Пожаревац издаје следеће:

Локацијске услове

Инвеститор изградње ветроелектране инсталисане снаге 66mw у Костолцу, се обавезује да изврши набавку и постављање једне посуде за комунални отпад - једног контејнера од 1.10м3 на свакој локацији објекта која захтева стално присуство радно ангажованих лица ветроелетране, са постављањем на локацији парцеле која омугућава слободни простор за постављање и маневрисање посуда за комунални отпад ради пражњења посуда и одвожења отпада.

За издавање техничких услова ЈКП „Комуналне службе" не потражују никакву накнаду.

Slobodan Jović 161281148-29079547 62044
Digitally signed by Slobodan Jović 161281148-2907954762044
Date: 2018.07.25 14:18:30 +02'00'

ЈКП „Комуналне службе" Пожаревац
В.Д.Директор
Слободан Јовић инг.тех.

ЈП "ТОПЛИФИКАЦИЈА"-Пожаревац

Јавно предузеће за производњу, пренос и дистрибуцију топлотне енергије, одржавање и експлоатацију термотехничких уређаја и инсталација и инжењеринг енергетских постројења и инсталација; за производњу гаса и дистрибуцију гасовитих горива преко система цеви; за производњу гаса за комуналне сврхе и дистрибуцију гаса

МБ: 07351682 ПИБ: 101971396 - Трг Радомира Вујовића бр. 2, 12000 Пожаревац

Тел: (012) 542-785 (секретаријат), 975 (дежурна служба), Факс: (012) 542-543,

e-mail: jpt@toplifikacija.co.yu, www.toplifikacija.co.yu

Бр. 4870/2
Датум: 24.07.2018.год.

Шифра партнера: 82
Шифра ГМ: -
Шифра ТПС: -

РЕПУБЛИКА СРБИЈА
МИНИСТАРСТВО ГРАЂЕВИНАРСТВА, САОБРАЋАЈА И ИНФРАСТРУКТУРЕ

11000 Београд
Немањина број 22-26

Технички услови за пројектовање и прикључење на ТС БР 112/2018

Поштовани,

У вези Захтева бр. 4870 од 23.07.2018. године (Ваш број 350-02-00280/2018-14 ROP-MSGI-19614-LOC-1/2018) за издавање техничких услова из надлежности ЈП „Топлификација“ Пожаревац за објекат који треба да се изгради:

Објекат:	ВЕТРОЕЛЕКТРАНЕ ИНСТАЛИСАНЕ СНАГЕ 66MW У КОСТОЛЦУ ИНВЕСТИТОР: ЈП „Електропривреда Србије“, Београд		
Број и површина парцеле	К.О. Брадарац: К.П. бр. 410, 411, 481, 3352, 429, 475, 468, 612, 547 и 522, 407, 408, 409, 418, 419 и 923, 452/1, 962, 448, 447, 446, 445, 444, 443, 959, 465, 466, 467, 469, 470, 471, 472, 473, 474, 957, 484, 483, 482, 917, 428, 922, 539, 538, 953, 540, 951, 611, 541, 542, 543, 544, 545, 546, 548, 549, 550, 525, 524, 523, 931, 1122, 1611, 1613, 3340, 3131, 3132, 3338, 3004, 2965, 3353, 3349, 2519, 3359/2, 613, 417; К.О.Ћириковац: К.П. бр. 1550 и 1551/1, 1857, 1854, 1820, 1551/2, 1551/3, 3490/1, 3491; К.О. Кленовник: К.П. бр. 2482/2, 2896, 1433 и 1417, 2908, 2482/1, 2907, 2261, 2262, 2260, 2263, 2258, 2257, 2256, 1431, 1430, 1432, 1434, 1425, 1424; К.О. Костолац село: К.П. бр. 2460, 2650/1, 1640/1, 2686.		-
Тip објекта:	☑ Самостојећи	□ Објекти у низу	□ Део зграде
Намена појединих делова:	□ Стамбени	□ Пословни	☑ Остало
Класификација делова			230201

Назив локације:

Бруто развијена површина (m^2):			-
Грејна површина (m^2):			-
Топлотна снага (kW):			-
Спратност: (По+П+бр. Спр.+Пк):	-		
Категорија објекта	□ А	□ Б	☑ Г

обавештавамо вас следеће:

1. Технички услови за пројектовање објекта:

Статус објекта:	**☑ Постоје посебни технички услови за пројектовање**	□ Не постоје посебни технички услови за пројектовање

Образложење:	-На делу трасе Ваше унутрашње кабловске мреже 35kV (УКМ) предвиђене Идејним решењем које сте доставили уз захтев, инсталације предвиђене за изградњу се укрштају са надземним топловодом Костолац-Пожаревац који је у надлежности ЈП „Топлификација“ Пожаревац. Према приложеној графичкој документацији место укрштања је на К.П. бр. 3491, К.О. Ћириковац (део УКМ за ветрогенераторе ВГ8, ВГ9 и ВГ10). Укрштање је потребно планирати на средини распона постојећег цевовода (између два бетонска ослонца), уз поштовање минималне дубине полагања високонапонског кабла од 1 метра. У осталим зонама предвиђеним за градњу ветрогенератора и унутрашње кабловске мреже не постоје изведене инсталације система даљинског грејања којима управља ЈП „Топлификација“ Пожаревац. О изведеним инсталцијама система даљинског грејања других надлежних дистрибутера које се налазе на територији К.О. Кленовник и К.О. Костолац село потребно је да се информишете код надлежних служби ЈП „ЕПС ТЕ-КО“ Котолац и Градске општине Костолац.

2. Технички услови за прикључење на систем даљинског грејања и пројектовање унутрашње инсталације грејања:

Статус прикључка:	□ Постоје технички услови за прикључење	□ Не постоје технички услови за прикључење	**☑ Не издају се технички услови за прикључење**

Образложење:	-Прикључење објекта на систем даљинског грејања није предвиђено.

Опште информације

1. <u>Објекат који се гради, односно чије је грађење завршено без одобрења за изградњу и важеће техничке документације, не може бити прикључен на систем даљинског грејања у складу са важећим Законом о планирању и изградњи.</u>
2. Објекти изграђени без грађевинске дозволе, а који су у поступку легализације, могу се <u>привремено</u> прикључити на ТС до правоснажног окончања поступка легализације. По правоснажном окончању поступка легализације, којим се одбацује или одбија захтев за легализацију предметног објекта, ЈП “Топлификација” ће без одлагања искључити објекат са топлификационог система по налогу грађевинског инспектора.

3. Радови на ТС се изводе у грађевинској сезони, с тим да је почетак радова, након добијања потребних сагласности и дозвола, а завршетак свих радова 01. октобар исте грађевинске сезоне.
4. За све информације и договоре обратити се надлежном раднику Инфо центра ЈП „Топлификација".
5. Технички услови важе у складу са законом и подзаконским актима.

Израдио:

ЈП „ТОПЛИФИКАЦИЈА"
Руководилац техничког система:

(МП)

Предраг Павловић,.инж.маш.

Златко Цвејић,дипл.инж.маш.

До: 1 x Наслову, 1 x а/а-досије купца

ЗЛАТКО ЦВЕЈИЋ 1410966762036-1410966762036

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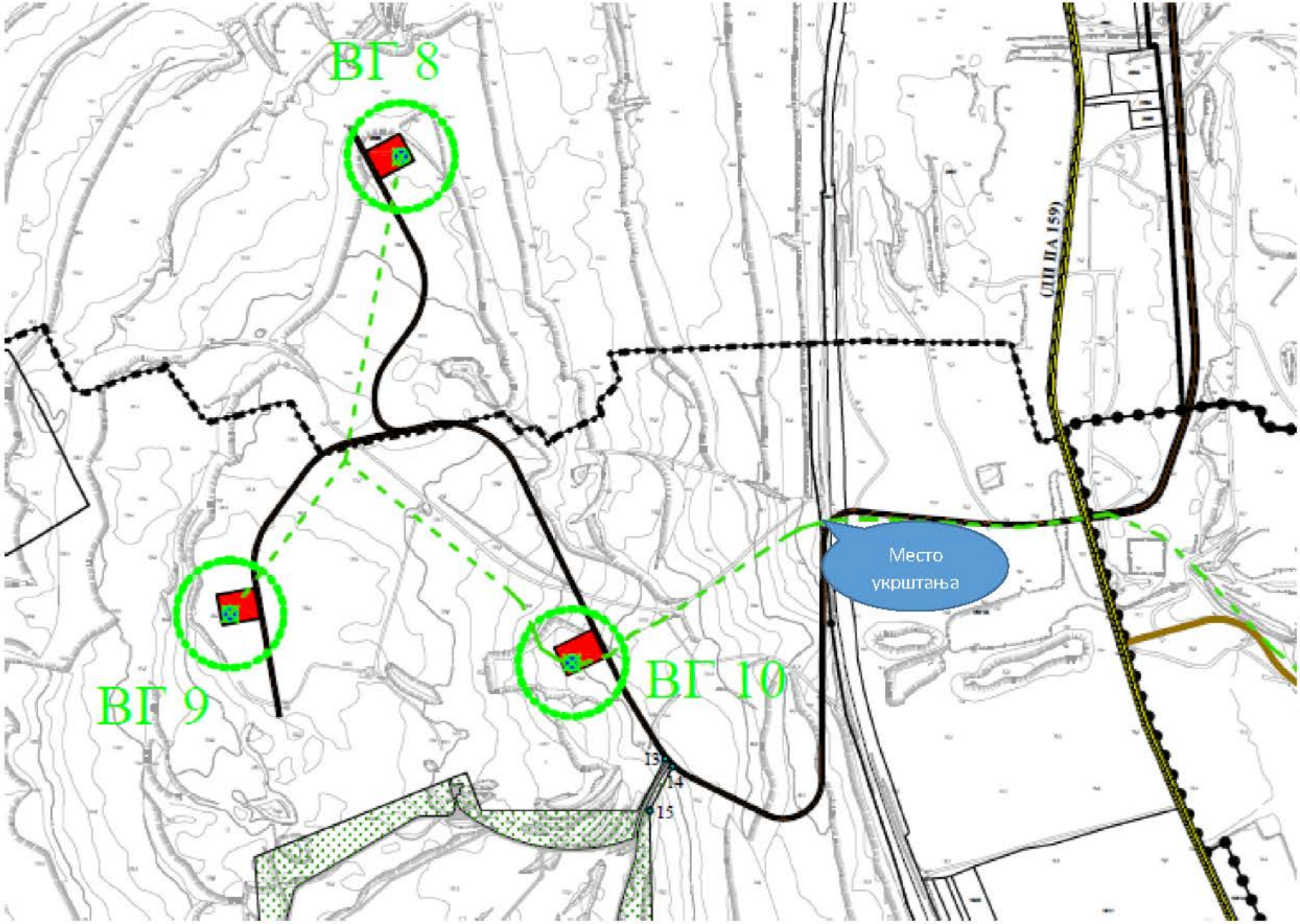
Date: 2018.07.24 15:09:37 +03'00'


ВГ 8
ВГ 9
ВГ 10
Место укрштања
(ДП IIA 159)
13
14
15

РЕПУБЛИКА СРБИЈА
МИНИСТАРСТВО УНУТРАШЊИХ ПОСЛОВА
Сектор за ванредне ситуације
Управа за превентивну заштиту
09/4 број 217-841/18
Дана 24.07.2018. године
ROP-MSGI-19614-LOC-1-HPAP-8/2018
Ул. Омладинских бригада бр. 31
Београд

Министарство унутрашњих послова Републике Србије, Сектор за ванредне ситуације, Управа за превентивну заштиту, на основу чл. 54 Закона о планирању и изградњи („Сл. гласник РС", бр. 72/09, 81/09, 24/11, 121/12, 42/13, 50/13, 98/13, 132/14 и 145/14), чл. 16 став 2 Уредбе о локацијским условима („Сл. гласник РС", бр. 35/15, 114/15 и 117/17) и Правилника о поступку спровођења обједињене процедуре електронским путем („Сл. гласник РС", бр. 113/15, 96/16 и 120/17), решавајући по захтеву Министарства грађевинарства, саобраћаја и инфраструктуре бр. 350-02-00280/2018-14 од 12.07.2018. године, достављеном у име ЈП ЕПС Београд, ул. Балканска бр. 13, у поступку издавања локацијских услова у оквиру обједињене процедуре електронским путем ROP-MSGI-19614-LOC-1-HPAP-8/2018, издаје:

УСЛОВЕ У ПОГЛЕДУ МЕРА ЗАШТИТЕ ОД ПОЖАРА

за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу која обухвата ветроелектрану „Костолац" и прикључак ветроелектране Костолац на преносни систем, на кат. парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, Пожаревац, према достављеном идејном решењу, израђеним од стране предузећа „Нетинвест" д.о.о. Београд, Трг Николе Пашића 1.

У вези издавања ових услова, обавештавамо вас да овај орган **НЕМА** посебних услова у погледу мера заштите од пожара, као и да је у фази пројектовања и изградње предметног објекта са свим припадајућим инсталацијама, опремом и уређајима, потребно применити мере заштите од пожара **утврђене важећим законима, техничким прописима, стандардима и другим актима којима је уређена област заштите од пожара.**

Издати услови у погледу мера заштите од пожара су саставни део локацијских услова, на основу којих се издаје решење о грађевинској дозволи, које је потребно доставити овој Управи у складу са чл. 138 Закона о планирању и изградњи.

Сходно чл. 123 Закона о планирању и изградњи, а у складу са одредбама Правилника о поступку спровођења обједињене процедуре електронским путем и чл. 34 Закона о заштити од пожара („Сл. гласник РС“, бр. 111/09 и 20/15) потребно је, пре отпочињања поступка за утврђивање подобности објеката за употребу, доставити на сагласност пројекте за извођење објеката, чији је саставни део и Главни пројекат заштите од пожара.

Такса у износу од 16.750,00 динара утврђена је сходно тарифном бр. 46а Закона о републичким административним таксама (“Сл. гласник РС”, бр. 43/03, 51/03, 61/05, 101/05, 5/09, 54/09, 50/11, 70/11, 55/12, 93/12, 47/13, 65/13, 57/14, 45/15, 83/15, 112/15, 50/16, 61/17, 113/17, 3/18 и 50/18).

НАЧЕЛНИК УПРАВЕ
главни полицијски саветник

Др Иван Зарев

Јавно водопривредно предузеће „Србијаводе“ Београд
Водопривредни центар „Сава - Дунав“
11070 Нови Београд, Бродарска 3; www.srbijavode.rs, vpcsavadunav@srbijavode.rs;
Текући рачун: 200-2402180101045-97; ПИБ: 100283824; Матични број: 17117106;
Наменски рачун трезора: 840-78723-57; ЈБКЈС: 81448; Телефон: 011/201-81-00, 311-43-25;
Факс: 011/311-29-27

Број: 6917/3 Датум: 02.08.2018.

НМ

На основу чл. 115, 117 и 118. Закона о водама („Сл. гласник РС“, број 30/2010, 93/2012 и 101/2016) – (у даљем тексту: ЗОВ), Закона о планирању и изградњи („Сл. гласник РС“, број 72/09, 81/09-исправка, 24/11, 121/2012, 42/2013-УС, 50/2013-УС, 98/2013-УС, 132/2014 и 145/2014), Правилника у поступку спровођења обједињене процедуре електронским путем („Сл. гласник РС“, број 113/2015, 96/2016 и 120/2017), Правилника о садржини и обрасцу захтева за издавање водних аката, садржини мишљења у поступку издавања водних услова и садржини извештаја у поступку издавања водне дозволе („Сл. гласник РС“ број 72/2017) и Упутства о начину поступања надлежних органа и ималаца јавних овлашћења који спроводе обједињену процедуру у погледу водних аката у поступцима остваривања права на градњу, решавајући по захтеву Министарства грађевинарства, саобраћаја и инфраструктуре (број: ROP-MSGI-19614-LOC-1/2018 од 12.07.2018. године, наш број: 6917 од 23.07.2018. године) у име инвеститора Јавног предузећа „Електропривреда Србије“ а.д. Београд, ул. Балканска 13 (МБ: 20053658, ПИБ: 103920327), за издавање водних услова за израду техничке документације, ЈВП „Србијаводе“ - ВПЦ „Сава-Дунав“, издаје

ВОДНЕ УСЛОВЕ

1. Одређују се технички и други захтеви који морају да се испуне у поступку припреме и израде техничке документације за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу, на катастарским парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца.
2. Водни услови се издају за изградњу нових објеката, доградњу и реконструкцију других објеката и извођење других радова који могу утицати на промене у водном режиму;
3. Водни услови су евидентирани у Уписник водних услова за водно подручје Дунав, под редним бројем 145 од 02.08.2018. године.
4. Техничку документацију израдити у складу са прописима који уређују израду пројеката и усвојити техничко-технолошка решења уз испуњење следећих услова:

4.1. Да техничка документација буде урађена у складу са важећим прописима и нормативима за ову врсту објеката односно радова с тим да предузеће које се бави израдом пројектне документације мора имати потврду о референцама и лиценцама за пројектанте;

4.2. На пројекат прибавити техничку контролу, према важећим законским прописима;

4.3. Техничку документацију ускладити са важећом планском документацијом;

4.4. За потребе израде техничке документације урадити детаљни ситуациони план ове локације у размери Р=1:100, са снимљеним стањем терена у апсолутним котама (то подразумева тежиште тачкастих објеката, као и почетну и крајњу тачку линијских објеката, у Gauss-Kriger координатама, сходно Правилнику), при чему је потребно нанети предметне катастарске парцеле, веродостојно подацима из копије плана, назнаке бројева и власника суседних парцела.

4.5. При изради детаљног ситуационог плана, обавезно снимити и приказати појас приобалног земљишта поред реке Млаве, са којом се електоренергетски вод укршта, или водних објеката поред којих се поставља паралелна траса кабловског вода;

4.6. На основу претходних радова и одговарајућих подлога (урбанистичке, геодетске, геомеханичке, геолошке, хидролошке, хидрогеолошке, псамолошке...), усвојеног степена заштите, постојеће документације и водних аката, дефинисати границе угроженог подручја, извршити све потребне анализе и прорачуне и усвојити таква решења, која ће у техничком, економском и функционалном смислу дати оптимални степен заштите;

4.7. Избор оптималне диспозиције трасе електоренергетског вода прилагодити условима коришћења суседних локалитета које користе други корисници, чији се рад не сме ометати. Инвеститор радова је дужан да сноси трошкове свих штета које причини;

4.8. За све планиране активности током изградње, мора се предвитети адекватно техничко решење у циљу спречавања негативних утицаја на водни режим;

4.9. При изради техничке документације, којом ће се дефинисати техничка решења и технички услови за извођење предвиђених радова, водити рачуна о постојећем водним објектима (водним актима и техничкој документацији) на начин који ће обезбедити заштиту њихове стабилности и заштиту режима вода;

4.10. Дефинисати прецизне геодетске податке укрштања електроенергетског вода са постојећим водним објектима и реком Млавом;

4.11. Воде и водно земљиште у јавној својини су јавно водно добро и користе се на начин и под условима утврђеним Законом о водама. Инвеститор је у обавези да реши имовинско правне односе, у зони изградње и коришћења објеката на водном земљишту са надлежним Јавним водопривредним предузећем „Србијаводе“ Београд;

4.12. Пројектном документацијом предвидети да се стубови кабловског вода не могу градити у речном кориту, односно морају бити удаљени најмање 10 метара од корита водотока. Такође по потреби предвидети заштиту стубова кабловског вода од великих вода водотока на локацијама на којима могу бити угрожени услед нестабилних обала и на местима конкавних кривина. Заштиту обале извршити од каменог набачаја одговарајуће гранулације;

4.13. Обзиром да се ради о надземном преласку кабловског вода у зони укрштања са водотоком, непходно је да се у најнеповољнијим условима експлоатације обезбеди минимум 7 m до најниже коте ланчанице кабла;

4.14. Електоренергетски вод на месту укрштања са водотоком мора бити изолован, како не би дошло до електро – пражњења. Угао укрштања са водним објектима не сме бити мањи од 30°;

4.15. Приликом изградње електоренергетског вода, ветрогенератора, транформатора и управне зграде и касније у њиховој експлоатацији и одржавању, потребно је предвидети мере заштите од загађења вода, посебно од изливања отпадних вода и минералних уља (уколико се користе);

4.16. Евакуацију атмосферских вода са потенцијално зауљених површина, морају пре упуштања у реципијент (није дозвољена евакуација вода у такозване упојне бунаре), проћи третман одвајања чврсте фазе у таложнику, односно третман преко сепаратора уља и масти, прописно димензионисаног, за меродавне падавине. Пројектом дефинисати режим пражњења таложника, од стране овлашћеног предузећа;

4.17. Евакуацију површинских незагађених вода, са крова објекта управне зграде, решити посебним системом са одводом воде до реципијента-путног јарка или зелене површине;

4.18. Санитарно-фекалне отпадне воде, прикупити у прописно изграђену водонепропусну септичку јаму (најекономичније решење, обзиром на број радника који ће опслуживати постројење) и празнити је преко овлашћеног комуналног предузећа;

4.19. Уколико постоји потреба за употребу нафте и њених деривата, предвидети све мере заштите да не дође до загађења површинских и подземних вода;

4.20. Ако се се снабдевање противпожарном и техничком водом реши захватањем воде из подземља, путем бушеног бунара, неопходно је урадити елаборат или други документ овлашћеног правног лица о количини и квалитету воде која се захвата, израђен на основу претходних истраживања спроведених од стране овлашћеног правног лица током бар једне хидролошке године;

4.21. Ради заштите постојећег изграђеног одбрамбеног насипа и канала, инвеститор се мора придржавати „Забране, ограничење права и обавезе власника и корисника водног земљишта и водних објеката“ које проистичу из члана 133-137. ЗОВ-а;

4.22. Пројектом се морају дефинисати технички услови за извођење радова, којима се може угрозити стабилност постојећих водних објеката и водни режим. Евентуална оштећења која настану у току извођења радова морају се отклонити о трошку инвеститора;

4.23. Пројектом предвидети да се приликом вршења радова, ископа и насипања за потребе изградње, одреди место одлагања материјала. Материјал се не сме одлагати у корито и на обале водотокова, стараче, канале....;

5. Надлежни орган који издаје грађевинску дозволу, у обавези је да грађевинску дозволу заједно са пројектом за грађевинску дозволу достави Јавном водопривредном предузећу, ради утврђивања усклађености техничке документације са издатим водним условима;

6. По завршетку изградње објекта и техничког прегледа објекта, инвеститор је у обавези да се обрати Јавном водопривредном предузећу, са захтевом за издавање водне дозволе.

О б р а з л о ж е њ е

Министарство грађевинарства, саобраћаја и инфраструктуре, у име инвеститора Јавног предузећа „Електропривреда Србије“ а.д. Београд, ул. Балканска 13 (МБ: 20053658, ПИБ: 103920327), поднело је захтев у поступку обједињене процедуре за локацијске услове, под бројем: ROP-MSGI-19614-LOC-1/2018 од 12.07.2018. године, ради добијања водних услова за израду техничке документације за изградњу ветроелектране инсталисане снаге 66 MW у Костолцу на катастарским парцелама у КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село, на територији града Пожаревца.

Уз захтев је, кроз систем обједињене процедуре, преузета следећа документација у електронском облику:

- Идејно решење - Ветроелектрана инсталисане снаге 66MW, 0-главна свеска 1-идејно решење архитектуре, 4-идејно решење електроенергетских инсталација инсталација, урађено од стране Предузећа за производњу, промет и услуге „Нетинвест“ д.о.о. Београд;
- Информација о локацији број 350-02-00280/2018-14 од 12.07.2018. године, издата од стране Министарства грађевинарства, саобраћаја и инфраструктуре;
- Копије катастарског плана водова КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село за предметне парцеле, број 952-04-030-836/2018 од 18.07.2018. године, дате од стране Републичког геодетског завода, службе за катастар непокретности Пожаревац у размери 1:2500;
- Копије катастарских планова КО Брадарац, КО Ћириковац, КО Кленовник и КО Костолац село за предметне парцеле, број 952-04-030-836/2018 од 19.07.2018. године, дате од стране Републичког геодетског завода, службе за катастар непокретности Пожаревац у размери 1:2500;
- Пуномоћје број 1201.79580/2-16 од 21.03.2016. године, дато Небојши Алексићу од стране „Електропривреде Србије“ Београд;
- Обавештење број 1-1155/2018 од 23.07.2018. године, дато од стране Републичког завода за заштиту споменика културе-Београд.

На основу преузете и наше расположиве техничке документације констатовано је следеће:

Најближи водоток планираној ветроелектрани и електроенергетском воду је река Млава, подслив Млава, водна јединица Млава и Пек - Петровац, водно подручје Дунав. На основу чл. 117. Закона о водама, предметни објекат припада типу објеката број 39) други објекти и радови, који могу привремено, повремено или трајно да проузрокују промене у водном режиму или на које може утицати водни режим, а према члану 43. истог закона, радови се могу сврстати у делатност типа 1) уређење водотока и заштита од штетног дејства вода и 3) заштита вода од загађивања.

Ветроелектрана Костолац са налази доминантно на просторима спољних одлагалишта и јаловишта која су настала као последица рударских активности у костолачком басену. Ветроелектрана се налази у зони Просторног плана подручја посебне намене Костолачког угљоносног басена (Службени гласник РС бр. 1/2013. и 20/2018) који обезбеђује просторно-плански основ за реализацију Пројекта.

Функционална целина ветроелектрана Костолац називне снаге 66 MW се састоји од следећих функционалних подцелина: ветроагрегати, који представљају генераторске јединице (састоје се од ротора, гондоле, торња и темеља, напонског нивоа 690V/35kV), унутрашње кабловске мреже (подземни кабловски водови напонског нивоа 35kV) и трафо станице 35/110kV (преко које се ветроелектрана прикључује на преносни систем ради пласмана произведене електричне енергије) са управном зградом (одакле се управља радом електране). У контексту наведеног, може се констатовати да се ветроелектрана састоји од објеката за производњу електричне енергије (ветроагрегати) и објеката за пренос електричне енергије (унутрашња кабловска мрежа и ТС са управном зградом).

Функционална целина Прикључак на преносни систем се састоји од: прикључно разводног постројења 110kV (са управном зградом) и прикључних далековода 110kV.

Пројекат изградње ветроелектране Костолац се реализује у две фазе (функционалне целине). Једна фаза представља функционалну целину ветроелектране Костолац, а другу представља функционална целина Прикључак на преносни систем.

Приступне саобраћајнице ветроагрегатима као и прикључци приступних саобраћајница на државне и општинске путеве нису обухваћене овим идејним решењем и

биће предмет другог Идејног решења и засебних локацијских услова. У изводу из планског документа приказано је и њихово концепцијско решење које ће детаљније бити разрађено засебном инвестиционо-техничком документацијом.

Предметна локација је обухваћена Републичким Оперативним планом одбране од поплава, у оквиру деонице ДЂ.2.6. у штићеном поплавном подручју Затворена касета „Доње костолачко острво“ и ДЂ.2.7. у штићеном поплавном подручју Затворена касета „Стари Костолац“, редовно одржавање је у надлежности Јавног предузећа „Електропривреда Србије“ Огранак „ХЕ Ђердап“ Сектор за одржавање приобаља, Пожаревац, односно ЈВП „Србијаводе“ Београд.

У складу са чланом 118. став 7. Закона о водама („Сл. гласник РС“, број 30/10, 93/12 и 101/16), по службеној дужности, прибављено је Мишљење Министарства заштите животне средине „Агенција за заштиту животне средине“, број 011-00-0001/164/2018-02 од 31.07.2018. године.

У Мишљењу „Агенције за заштиту животне средине“ закључено је да пројектном документацијом предвидети све мере које ће обезбедити да планирани радови буду у складу са Уредбом о граничним вредностима загађујућих материја у површинским и подземним водама и седименту и роковима за њихово достизање („Сл.гласник РС“, број 50/2012) и Уредбом о граничним вредностима приоритетних и хазардних супстанци које загађују површинске воде и роковима за њихово достизање („Сл. гласник РС“ број 24/2014).

Сходно условима из диспозитива Водних услова: 4.1.-4.23. Техничка документација треба да буде на нивоу пројекта за грађевинску дозволу у складу са одредбама Закона о водама („Сл. гласник РС“, број 30/2010, 93/2012 и 101/2016), Стратегијом управљања водама на територији Републике Србије до 2034. године („Сл. гласник РС“, број 3/2017), односно смерницама из Водопривредне основе РС (Уредба, Сл. гласник РС“, број 11/2002),
Закона о планирању и изградњи („Сл. гласник РС“, бр. 72/2009, 81/2009 - испр., 64/2010 – одлука УС, 24/2011, 121/2012, 42/2013 - одлука УС, 50/2013 - одлука УС, 98/2013 - одлука УС, 132/2014 и 145/2014) уз обавезне прилоге:

- доказ да је предузеће уписано у регистар за израду техничке документације са приложеним важећим и одговарајућим лиценцама одговорних пројектаната,
- техн. извештај и прорачуне (хидролошке, хидрауличке, димензионисање објеката и др.),
- техничко решење за објекте и мере, графичке прилоге у подужном и попречном смислу, приказ потребних и одговарајућих подлога и прорачуна, итд.

Услов број 4.23. и 4.24. дат је у складу са чл. 133. Закона о водама („Сл. гласник РС“, број 30/2010, 93/2012 и 101/2016).

Услов број 5 дат је у складу са чл. 118а Закона о водама („Сл. гласник РС“, број 30/2010, 93/2012 и 101/2016).

Услов број 6 дат је у складу са чл. 122 Закона о водама („Сл. гласник РС“, број 30/2010, 93/2012 и 101/2016).

На основу Правилника о садржини, начину и обрасцу водне књиге („Сл. гласник РС“, број 86/2010), водни услови су евидентирани у Уписник водних услова што је дато у услову број 3.

Накнада за израду водних услова износи 26.400,00. Износ треба уплатити на текући рачун број 200-2402180101045-97 Банка поштанска штедионица, са позивом на број 6 001 00215 000057.

Р У К О В О Д И Л А Ц
ВПЦ “Сава - Дунав“
Душан Панић, дипл. инж.

Dušan Panić 2140818279-26 06954772015
Digitally signed by Dušan Panić 2140818279-26069547720 15
Date: 2018.08.02 09:55:42 +02'00'

Доставити:
- Подносиоцу захтева
- Одељ. за кориш. и газд. водама (х2)
- Републичкој дирекцији за воде, Немањина 22-26 (х2)
- А р х и в и

Инфраструктура железнице Србије а.д.

АКЦИОНАРСКО ДРУШТВО ЗА УПРАВЉАЊЕ ЈАВНОМ ЖЕЛЕЗНИЧКОМ ИНФРАСТРУКТУРОМ „ИНФРАСТРУКТУРА ЖЕЛЕЗНИЦЕ СРБИЈЕ“

11000 БЕОГРАД, Немањина 6, Поштански фах 166, МБ: 21127094, ПИБ: 109108420, Текући рачун: 205-222959-26
Тел. +(381 11) 36 18463 Žat: 330 *milan.maksimovic@srbrail.rs*

Број: 2/2018-986
Дана: 03.08.2018.
Наш знак: ЖР

ЈП „ЕЛЕКТРОПРИВРЕДА СРБИЈЕ” БЕОГРАД

Балканска бр. 13
11000 Београд

ПРЕДМЕТ: **Технички услови за изградњу ветроелектране “Костолац” и укрштање 35kV енергетског кабловског вода са железничком пругом (Пожаревац) – Распотница Сопот Пожаревачки – Костолац у km 5+522, на територији града Пожаревца**

Примили смо допис ROP-MSGI-19614-LOC-1/2018 од 12.07.2018. године, Министарства грађевинарства, саобраћаја и инфраструктуре за издавање услова за изградњу ветроелектране у Костолцу на к.п. КО Бродарац, КО Ћириковац, КО Кленовник и КО Костолац село на територирији града Пожаревца, које прибављају у поступку обједињене процедуре за инвеститора ЈП “ Електропривреда Србије” Београд. На основу увида у достављену документацију и записника стручне комисије формиране Решењем број 2/2018-963 од 30.07.2018. године са увиђаја на лицу места извршеног дана 31.07.2018. године, "'Инфраструктура железнице Србије" а.д. прописује следеће техничке услови за за изградњу ветроелектране “Костолац” и укрштање 35kV енергетског кабловског вода са железничком пругом (Пожаревац) – Распотница Сопот Пожаревачки – Костолац у km 5+522, на територији града Пожаревца:

1. Могуће је изградити ветроелектрану „Костолац“, инсталисане снаге 66MW, са леве стране железничке пруге (Пожаревац) – Распотница Сопот Пожаревачки – Костолац, од наспрам km 4+340 до наспрам km 6+150 и са десне стране железниче пруге (Пожаревац) – Распотница Сопот Пожаревачки – Костолац, од наспрам km 5+300 до наспрам km 9+990, а на удаљености већој од 200m мерено управно на осу најближег колосека железничке пруге.
2. Могуће је извршити осовинско укрштање трасе 35kV енергетског кабловског вода са железничком пругом (Пожаревац) – Распотница Сопот Пожаревачки – Костолац у km 5+522, а под углом од 90°. Ово осовинско укрштање извршити на удаљености 8,0m од осе путног прелаз у km 5+530.
3. Електроенергетски кабловски вод испод трупа пруге (Пожаревац) – Распотница Сопот Пожаревачки – Костолац поставити у заштитну ПЕ или ПВЦ цев одговарајућег пречника.

4. Заштитну цев утиснути кроз труп пруге помоћу хидрауличне пресе или бургије и поставити на дубину од минимум 1,8m од горње ивице прага до горње ивице заштитне цеви, односно на минимум 1,2m од најниже коте терена ван трупа пруге до горње ивице заштитне цеви и минимум 0,5m од коте дна одводног канала.

5. Заштиту цев, на месту укрштаја са железничком пругом (Пожаревац) – Распотница Сопот Пожаревачки – Костолац поставити испод трупа пруге у континуитету на минималној дужини од 16m, односно тако да се иста завршава са леве и десне стране колосека на минималној удаљености од 8m мерено управно на осу колосека железничке пруге, односно крајеви заштитне цеви морају бити на удаљености 1m од ивице ножице насипа.

6. Код вођења трасе у инфраструктурном појасу железничке пруге 35kV енергетски кабловски вод положити на минималној дубини од 0,8m од коте терена.

7. Траса 35kV енергетског кабловског вода код полагања у зони пружног појаса мора бити видно обележена стубићима са одговарајућим ознакама.

8. Код копања радног рова посебна пажња се мора обратити на стање и положај железничких и осталих подземних, површинских и ваздушних инсталација како не би дошло до оштећења истих. Положај каблова на терену мора се пажљиво утврдити трагачем и ручним "шлицовањем".

9. Приступ објектима ветроелекртане „Костолац“ остварити са постојеће друмске саобраћајне мреже.

10. На месту укрштања са железничком пругом (Пожаревац) – Распотница Сопот Пожаревачки – Костолац електроенергетски 35kV кабловски вод ће бити положен по железничком земљишту, на катастарској парцели број 3490/1 КО Ћириковац у дужини од око 20m.

11. На основу ових техничких услова не може се приступити извођењу радова, већ је инвеститор у обавези да за предметне радове изради одговарајућу техничку документацију (Пројекат за грађевинску дозволу) и један примерак исте достави Сектору за развој, "Инфраструктура железнице Србије" а.д. Немањина бр. 6 ради добијања Решења о верификацији (Сагласности) на техничку документацију. У примерак техничке документације ставити један препис ових техничких услова.

12. Инвеститор је обавезан да један примерак Извода усвојен техничке документације, а усвојену документацију на увид, достави ОЦ ЗОП Пожаревац (Кнез Милошев венац бб, тел. 012/223-722), ради надзора и архиве техничке документације.

13. За време извођења радова је, поред надзора Инвеститора, неопходан и надзор стручних служби „Инфраструктура железнице Србије“ а.д. у циљу очувања железничког саобраћаја и заштите железничке инфраструктуре. У том смислу, пре почетка извођења радова Инвеститор је обавезан да извести ОЦ ЗОП Пожаревац, како би технички органи проверли исправност радова везану за ове техничке услове. Надзорни орган ће на лицу места решити све случајеве који нису обухваћени овим техничким условима у складу са важећим прописима и интерним железничким правилницима.

14. Трошкове надзора са аспекта заштите железничке инфраструктуре за време извођења радова у пружном појасу, као и све остале трошкове ангажованих инфраструктурних ресурса сноси Инвеститор. Висина напред наведених трошкова биће дефинисана посебним Уговором између Инвеститора и "Инфраструктура железнице Србије" а.д. који се мора склопити пре почетка извођења радова, а по добијању Решења о верификацији техничке документације. За склапање Уговора Инвеститор се мора обратити Сектору за саобраћајне послове, "Инфраструктура железнице Србије" а.д. (Немањина бр. 6, тел. 011/361-82-14).

15. Инвеститор је у обавези да након добијања Сагласности на техничку документацију, а пре почетка извођења радова обрати Сектору за грађевинске послове, "Инфраструктура железнице Србије" а.д. (Немањина 6, тел. 011/361-84-30) ради конституисања службености пролаза. Такође, обавеза инвеститора је да достави ситуацију са дефинисаним катастарским парцелама и уцртаном трасом предметне инсталације (са дефинисаном дужином трасе 35kV вода преко железничког земљишта).

16. По завршетку извођења радова, железнички надзорни орган је дужан да са Инвеститором и извођачем радова сачини записник о извршеним радовима и исти достави Сектору за развој и Сектору за грађевинске послове, „Инфраструктура железнице Србије“ а.д.

17. Све штете које евентуално могу настати по "Инфраструктура железнице Србије" а.д. у току извођења радова извођач радова је дужан да надокнади овом предузећу, а надаље током експлоатације инвеститор.

18. Свим променама које могу настати на овом делу пруге за потребе железнице, инвеститор је дужан да се прилагоди са својом ветроелектраном и електроенергетским кабловским водом у одређеном року и о свом трошку.

19. „Инфраструктура железнице Србије“ а.д. неће сносити никакву одговорност у случају настанка било какве штете на ветроелектрани и кабловском 35kV воду због близине пруге, нити је обавезно да било какву штету надокнади инвеститору.

20. Уколико се са радовима не започне у року од 2 (две) године технички услови се морају поново тражити.

Достављено:

- Сектору за грађевинске послове
- Сектору за електротехничке послове
- Сектору за саобраћајне послове
- ОЦ ЗОП Пожаревац

ИЗВРШНИ ДИРЕКТОР ЗА
УПРАВЉАЊЕ ЈАВНОМ
ЖЕЛЕЗНИЧКОМ ИНФРАСТРУКТУРОМ

Максимовић Милан, дипл.инж.саоб.